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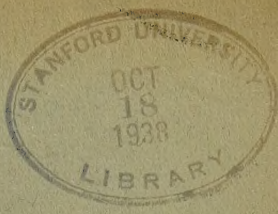

THE THEORY OF PSYCHICAL DISPOSITIONS

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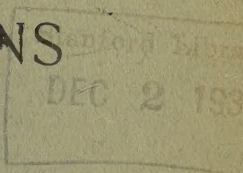

BY

CHARLES A. DUBRAY, S.M.

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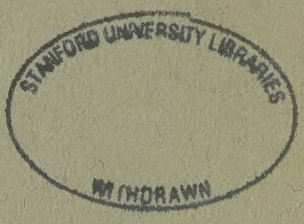

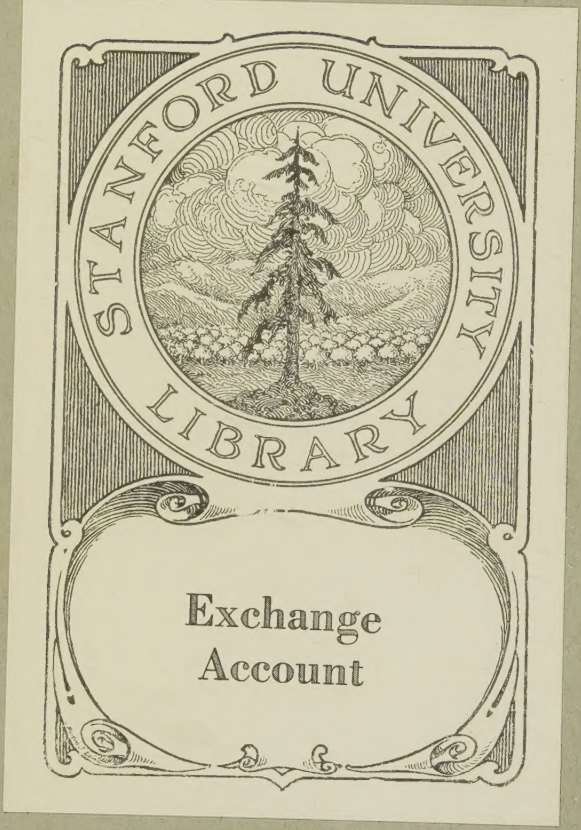

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THE THEORY OF

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CHARLES A. DUBRAY, S.M.

A Dissertation

Submitted to the Faculty of Philosophy of the Catholic University of America in Partial Fulfilment of the Requirements for the Degree Doctor of Philosophy

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PREFACE.

The progress which psychological research has made in modern times, far from dispensing with the need of theories, has rather accentuated it. New facts have been discovered or more thoroughly investigated, and where the explanation was not at hand, and could not be found empirically, recourse to theories was rendered necessary.

Of these theories some are entirely new, and therefore suggest new philosophical views of the mind; others are principally modifications of earlier theories, and adaptations to meet the needs of present science; others finally are distinct, yet not always conscious, survivals of theories of the past.

In this revival of past theories, it sometimes occurs that the essential, the fundamental basis of the theory is discarded, while that which is secondary or less essential is preserved; and thus the attempt is made to incorporate certain elements of an older theory in the new. Whenever this happens, it is interesting to examine how far this dismemberment of a theory of the past and the exclusive preservation of certain portions of it is justified.

Generally speaking, the modern philosophy of the mind has abandoned the Aristotelian and scholastic view of a substantial soul; it has retained nevertheless the concept of psychical dispositions. This concept, whatever name may have been given to it, was an actual and logical product of the older theory, so that in using it the scholastics were perfectly consistent.

Can we say the same of modern philosophers? Does this fragment of an ancient edifice find a suitable place in the modern structure? Or is it out of proportion and harmony with the new system into which it has been incorporated? Such is the question which we shall attempt to answer in the following pages. This has necessitated a historical survey, as well as an analysis of the theory under discussion. It is not intended, however, to test directly the value of the scholastic doctrine concern-

ing the soul and its faculties; nor on the other hand to criticize in any thorough-going way modern theories concerning the nature of the mind. The primary aim of the investigation is to compare the medieval and the various modern systems from the point of view of logical consistency.

Consequently, after (1) a brief review of the facts which have to be explained, we shall (2) consider how they have been accounted for in the past, and (3) how they are accounted for at the present time. This will lead us (4) to inquire into the concept of psychical dispositions; finally (5) we shall examine the logical aspect of the theory.

It is a pleasing duty for the writer to acknowledge his indebtedness to Professor E. A. Pace for the help which he has given in the preparation of this study, the numerous suggestions which he has made, and for the constant care with which he has directed the philosophical studies of the author.

BIOGRAPHY.

The author of this dissertation was born November 2, 1875, at Villaines-sous-Lucé, a small town of the department of Sarthe (France). After attending the primary schools, he entered the 'Petit Séminaire' at Sées (Orne) where he pursued the study of the classics. In 1893 he entered the Society of Mary, and after spending one year in England, came to America. He studied philosophy two years in the scholasticate of the Society in Maryland, and then came to the Marist College, near the Catholic University, Washington, D. C., for his theological studies. He followed at the University the courses of Holy Scripture under Professor C. P. Grannan; of Church History under Professor T. J. Shahan, and of Hebrew under Professor H. Hyvernat. In 1899 he received the degree of Bachelor in Theology and was ordained to the priesthood. Having been appointed professor of philosophy at the Marist College, he matriculated in the department of philosophy at the Catholic University in 1900, and studied philosophy and psychology under Professor E. A. Pace, and Greek under Professor G. M. Bolling.

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CHAPTER I. Summary of the Facts.

Diversity of Conscious States.

Nothing in nature is more varied, more changing than human consciousness. Mental states are constantly succeeding one another, constantly forcing one another out of the field of consciousness. Hardly has one appeared before it is hurried into the past by another. Of the inner world of consciousness especially can we say what Heraclitus said of the universe: everything changes and flows: "πάντα ῥεῖ." This flowing, this succession is so essential to the living human consciousness that a persistent idea, one which refuses to retire and interrupts the stream, is characteristic of an abnormal mind.

There is not one stream of consciousness, but there are as many streams as there are individuals; and if we compare men with one another, we also find the greatest variety of conscious states. It seems certain that, of all the individuals who now exist or have existed in the past, two could not be found whose contents of consciousness at any given time were exactly similar, or even two who ever experienced conscious states exactly alike. At any given moment, if it were possible to obtain an insight into all human consciousness, to make as it were a cross section of it, we would perceive an infinite variety of cognitive, affective and conative states, each differing in many respects from all the others.

That such differences in the mental states of several individuals depend in a large measure upon differences in the environment is obvious. Sensations of sight, of hearing, of touch, of pressure, of heat and cold, etc., which affect the mind more frequently than does any other state, and which are for the most part occasions and determinations of other conscious processes, depend essentially on surrounding objects which stimulate the sense organs. In fact all our states of consciousness,

representative, emotional or conative, have their origin in our sensations and are determined by them.

We can therefore to a large extent account for the diversity of mental states in several men by external factors. But this is far from being an adequate explanation. If two persons be placed amid surroundings identical as far as possible, we still find a great difference in their states of consciousness. They will not see, hear, feel in the same manner. Their sensations will be the starting point of mental processes differing in a still greater degree. Attention, interest, associations and consequently the whole experience of the past together with the habits of life, must be taken into consideration.

We find in all persons differences of temperament, of bodily and mental condition, of age, sex, etc. There are native endowments which we receive with existence itself, and which are from the very beginning of our life ingrained in our nature, and all these influence our conscious states. '*Quidquid recipitur, per modum recipientis recipitur*' is an old scholastic axiom which we may apply here. When we receive an impression in consciousness, it is modified by our own condition.

But the actual condition of the mind is not determined only by its native endowments; past experiences have imprinted their mark on the mind. It is impossible to give a complete explanation of any mental state in the concrete, as it is *de facto* given, without taking past experience into consideration. The present conscious process is very complex in the causes which have determined its production and its character.

In some cases the relation of the present to the past is obvious; it is perceived spontaneously. In memory, for instance, we refer the present idea to another one which has been in consciousness before. The very nature of recognition is to perceive that the present idea is a reproduction of a past one. In other cases it is only by careful study, by long and patient research, by attentive and continuous introspection that we can discern the influence of one process on another. Even then our efforts are frequently unsuccessful, because that influence is too complex, and the result of too many factors. In no case can it be determined in all its details.

Thus we see that under the perpetual flux of conscious processes something must remain permanently, since the past continues to influence the present, and remains a powerful factor in the actual appearance and nature of our thoughts. This is more clearly perceived if we consider the development of the mind.

Mental Development.

Man cannot cast off his own nature, character, acquired tendencies and habits of life, all of which tend to modify his views of things. As we incessantly accumulate new experiences, our mind is constantly being modified. In many cases this is apparent; we are aware that we do not view the same objects now in the same manner as we did formerly. Our opinions, inclinations, tendencies are changed. In a word, our mind develops.

Mental development depends essentially upon this possibility of reviving past experience. And even when this past experience is not itself revived, it enters nevertheless as a factor more or less important, more or less distinct, in all our mental life. If we compare the mental operations of a man with those of a child, we can, with J. Sully,[1] reduce the differences to the three following points: Number, perfection, complexity. The adult goes through a number of processes far greater than the child, and these processes are more varied. He not only experiences sensations, but observes, compares, reasons. He attentively notices the points of likëness and of difference. He considers, discusses, deliberates and performs many other operations which in the child are either entirely wanting, or are found only in an imperfect, rudimentary condition. His operations reach also a higher degree of perfection, his sensations are more distinct, his discriminations more accurate, his judgments more certain and more general. All these are effected with less effort and more rapidly. They are, however, more complex than in the child. The mind has a greater capacity and a greater power. It can receive at the same time more impressions, and hence the processes of differentiation and of

[1] *Outlines of Psychology*, pp. 41 ff.

integration have a much higher complexity. The same impression can suggest in the mind by association a multitude of ideas. The mind can do more; each one of its actions depends on, and is determined by, a large number of circumstances and of past experiences, at least in an implicit and unconscious manner. The same would also prove true if we compared not the intellectual, but the emotional and volitional life of the adult with that of the child. An increase in the number, the perfection and the complexity of the processes would manifestly reveal itself.

Professor Baldwin describes these differences in the following terms: "The phenomena of the infant consciousness are simple, as opposed to reflective; that is, they are the child's presentations or memories simply, not his own observations of them. In the adult consciousness the disturbing influence of inner observation is a matter of notorious moment. It is impossible for me to know exactly what I feel, for the apprehending of it through the attention alters its character. . . . There is around every one of us a web of convention and prejudice of our own making. Not only do we reflect the social formalities of our environment, and thus lose the distinguishing spontaneities of childhood, but each one of us builds up his own little world of seclusion and formality with himself. . . . The child, on the contrary, has not learnt his own importance, his pedigree, his beauty, his social place, his religion, his paternal disgrace; and he has not observed himself through all these and countless other lenses of time, place, and circumstance. He has not yet turned himself into an idol nor the world into a temple."[1]

Mental development is not simply growth. It means, it is true, an increase, an accumulation, a storing up of ideas in the mind; but it means more than that. At the present time, when child-study and pedagogy have been the object of such patient and fruitful research, the principle has been made clearer and clearer that to furnish a mind with ideas is not the true method of education, nor the true means of developing the mental faculties. Plato himself brings out the same

[1] *Mental Development in the Child and the Race,* I., p. 4.

principle when he makes Socrates compare the art of education to the art of midwifery. The teacher does not infuse science into the pupil's mind, he simply directs and encourages his efforts. "My disciples," says Socrates, "make wonderful progress, as they themselves and everybody can see; and this is clear that they make this progress without ever learning anything from me, but from themselves finding and coming to the possession of many beautiful things."[1]

Mental development consists in an increase of power to acquire knowledge, both theoretical and practical, to discern, judge, coördinate, rather than in the acquisition of ideas. "We may say that the mind grows when it increases its stock of materials. It develops in so far as its materials are elaborated into higher and more complex forms. Mere growth of mind would thus be illustrated by an increase in the bulk of mental retentions, that is, in the contents of memory: development, by the ordering of these contents in their relations of difference and likeness, and so on."[2]

The mind is developed not only in its perceptive faculties, but also in its conative and affective faculties. The will and even the feelings, as well as the intellect, can and must be educated. They also are capable of modification, growth and perfection.

The facts of mental development and of mental differentiation necessarily imply that past perceptions, past operations, continue to have an influence on subsequent perception and operation. If the tendencies and aptitudes of the individual mind change, if the conscious states become more perfect and more complex, it is in consequence of increased exercise, of multiplied experiences; these therefore must leave in the mind some after-effect. This, as we have said above, is a partial and very important reason of the differences in the conscious states of several individuals, even when they are placed in similar circumstances. It is also the reason for the differences in the views of the same person at different times of his life.

[1] *Theætetus*, cc. VI., VII., pp. 149 ff.
[2] Sully, *Outlines of Psychology*, 40.

Mental development supposes that the mind not only receives, but also retains. It must acquire a certain facility for doing again what it has done before; it must have the power of recalling to consciousness that which has been given there in the past. In mental habit and memory the relations of two conscious phenomena that take place at different times are most apparent. We must now briefly consider those two factors, with which especially we have to deal in the present dissertation.

Habit.

In general, the term habit signifies all aptitude, all tendency to act in a special manner easily and rapidly; but in a stricter sense, it applies only to personal habit, acquired by one's own repeated operations. There are innate dispositions to experience a conscious state rather than another, to perform certain actions, to behave in such or such a manner. They depend on our native endowment, constitution, character, and are in many cases transmitted by heredity. With these we are not concerned for the present, but only with habits acquired by the individual himself, and which are the results of his own activity.

Habits are very important in our whole life, organic, mental, social and moral. They form in us what has rightly been called a second nature. We know that all action which has been repeated requires less and less effort. By exercise, the various organs of the body acquire strength, skill, dexterity. By frequent repetition every movement tends to grow easy, to be reproduced automatically without reflection and effort as soon as it is suggested. Complex series of coördinated movements also are facilitated; as soon as the series is started each one of its elements follows in turn without distinct consciousness and attention; it has become 'natural.'

For mental life also habit is of the greatest importance. By practice the senses acquire greater and greater perfection. Sight becomes more accurate; we can discriminate tints which at first appeared exactly similar; we can form a more precise estimate of distances, perspective, figures, etc. The ear distinguishes more readily the pitch, intensity, timbre, harmony of various sounds. In the same way, the other senses are 'edu-

cated,' adapted, trained, to perform their functions, or at least some of them, with increasing perfection and facility.

Memory and association themselves can become habitual; frequently repeated associations become stronger; the ties which connect several ideas become more steadfast and enduring. The more frequently ideas have appeared together in consciousness, the more apt will they be to recall one another if one of them is revived in consciousness.

We can also acquire habits, both general and special, of attention, reflection, introspection. These powers may be developed, applied to certain actions rather than to others. The higher faculties of the mind can be directed and improved. By sustained attention and application it is possible to acquire facility in studying sciences for which one felt neither taste nor aptitude. A man can always, at least in some degree, change his taste and tendencies, and acquire a relative facility where before he experienced nothing but dislike and difficulty.

Repeated effort strengthens the will and increases the power of determination; it develops self-control, self-restraint, mastery over oneself; it gives to the will the power to resist natural impulses and inclinations, and to carry out what has been resolved.

Thus in all human faculties, from the lowest to the highest, the influence of habit is felt and in all, its effects are essentially the same. That which was painful and disagreeable, becomes easy, automatic, connatural. That which required many conscious efforts, a constant attention, and unceasing watchfulness, is now performed without difficulty, and with scarcely any notice. Sometimes attention will even prevent us from doing habitual things correctly. Thus, for example, when we have some hesitation about the spelling of a word, reflection may rather increase the uncertainty. Let the hand write according to its own impulse, and frequently the spelling will prove correct, because there is an association which has been established between the motion of the hand and the word mentally conceived. Or one hesitating between two spellings may write the word according to both, and frequently the eye will, for the same reason, tell which of the two is correct. It is difficult

in those cases to determine how far the mind and the organism respectively contribute to the final result, but it is certain that both have a share in it. In some cases the habit is chiefly an adaptation of the organs, and in others it seems to be mostly mental. In this dissertation we consider mental habits; as to organic habits, we consider them only in so far as they refer to conscious processes.

Memory.

Memory sometimes means a general faculty or a certain class of operations; it refers to the power which the mind possesses of preserving and reproducing its past experiences. We say of a man that he has a good memory, a faithful memory, when he readily remembers what he has learned or perceived. We also speak of visual or of auditory memory, implying a special aptitude to remember colors or sounds; hence we have the visual or auditory types of memory.

Memory is also taken for the acts themselves of recall or reproduction, for the actual exercise of the faculty, and this implies three conditions: the presence of an idea in consciousness, its disappearance, and its recall. In some cases we have recognition, and it is an essential element of the complete act of memory. Yet we may see the same person, hear the same tune several times without recognizing them. The same idea may come back to consciousness without our being aware of the repetition and without our being able to perceive the similarity and identity.

We can reproduce and recognize mental impressions. After days, weeks, or years of absence, they may be recalled again to consciousness. Sometimes they present themselves unexpectedly; they flash again into our mind without effort on our part when we least expect them and even when we endeavor to keep them away. In other cases we try to recall to consciousness ideas which were there at some previous time, or we strive to make clear and distinct that which has left but a faint and obscure idea in the mind. While we do not and cannot revive all our past experiences, yet we cannot assign any limits to this possibility of reappearance. We can recall impressions re-

ceived formerly by the senses; colors, sounds, odors, etc., can be represented when the stimulus is no longer present. Pains and pleasures, desires and regrets, emotions and passions, the most abstract ideas, can also be remembered. Of no state that has once been present in consciousness can we say that it has disappeared never to return. How this is possible; what conditions are required; what laws govern memory; what is the nature of the state which is revived; and how it is related to the preceding state, we do not for the present have to determine. But the fact itself of reproduction is most evident; we experience it daily, and at every moment of the day; we recognize in the present state an echo or a consequence of a former state; we refer it back to a determined event in our past mental life. Memory is thus a fundamental factor of our mental life. Without memory, this life would be a disconnected series of successive states bearing no relation to one another, and in which nothing permanent, nothing constant would be found. Intellectual and moral development would be an impossibility; reading, speaking, reasoning could find no place. Since these actions essentially imply a connection of the present with the past, something of the past must remain in consciousness if we are to have the understanding of the present.

We not only revive past impressions as they have once occurred in the mind, but we associate them, we form new combinations and arrangements in consciousness; we modify our past. With ideas which have been given separately in consciousness, we construct new mental representations; we unite parts of mental images with parts of other images. Fancy has no limits; it not only can produce fantastic and grotesque representations, but when it is guided by reason, it becomes the principle of works of art and invention.

Summary.

We have briefly mentioned the facts which we have to consider in this work, namely, facts of memory and of mental habituation. We have confined ourselves to the most general statements, because the present study is not so much a study of the facts as of the theories proposed as explanations of these facts.

Additions from memory and habit group themselves unceasingly around the central nucleus with which we began our mental life; they modify it in such a manner that they make it even unknowable in itself. What a pure sensation, or any other mental state would be, apart from all the revived ideas, from associations, from habits, we certainly do not know.

A multitude of factors contribute to frame and mould our conscious life, our mental behavior, our character. And for this reason is our character essentially personal, similar to no other. To the primitive nucleus of native endowments and tendencies, our successive actions have added a much greater part; they have modified it and left on it their own imprint.

That there is a close connection between memory and habit is evident. Both are based on the same power of the mind to preserve something of the past. In order to be reproduced and recognized a conscious process must either remain or leave some lasting effect in the mind. The facility of action produced by the repetition of actions supposes also that these actions affect the mind in a permanent manner.

Briefly stated, therefore, the question which the psychologist has to solve is this: There are certain mental processes which certainly depend on past processes. The past in many ways influences the present. How shall we account for such an influence? How does the past, which as far as we can know directly has disappeared, affect the present?

CHAPTER II. History.

General Remarks.

The facts which we have just mentioned have evidently no claim to being new. There are sciences which have developed only after long periods of time, because the facts on which they are based, or which they seek to explain, were not sufficiently known. In proportion as human experience increases, and as, with the help of more perfect instruments and greater accuracy of observation, facts are discovered or become better known, new problems offer themselves for investigation, new facts ask for explanation. Hence new theories, new hypotheses, which could not even have been thought of before, are brought to light.

But this is not the case with our problem. Ever since men have existed, there have been facts of retention and reproduction of knowledge; in their organisms they have treasured up habits of skill, strength, dexterity; and in their minds, images, learning, science. To these we owe the progress and development of our race. Nor could men fail to notice and observe these facts which occur every day, and at every moment of the day; which can be perceived in others to a certain extent, but especially which each perceives in himself. The observation of our own actions and states is not, it is true, always easy; introspective attention, especially to the details of our mental life, is found to be sometimes very arduous, and comparatively few men are capable of it. But it is impossible for a man not to notice, at least in a general way, that the idea which now occurs to his mind is the same as, or at least similar to, the idea which had already been there before; or that the repetition of certain actions makes it easier to perform them anew. This appears the more certain, if we consider that these facts are of the greatest importance both for the organic life and the development of the mind.

That the ancients had a far less perfect and accurate knowledge of them than we have now is of course beyond doubt. They had no idea of memory experiments and of the accurate observations which are made in modern laboratories. But still, thinkers perceived enough facts to arouse their curiosity, and make them eager to find an explanation of these phenomena. Men are not satisfied with perceiving facts. They are, says Aristotle, desirous of 'knowing' them, that is, of understanding their conditions and causes.[1] Plato means the same thing when he tells us that wonder is the most important characteristic of a philosopher, and that it is the beginning of all philosophy.[2] For we wonder when we see that some unexpected event happens, or when we know a fact, but are ignorant of the causes that produce it.

We must find, therefore, in the history of philosophy attempts to solve the problem of the reproduction of our mental states. We shall endeavor to outline briefly some of these attempts, without trying to present the views of all philosophers. A complete summary would be too long, and is not necessary for our purpose. But in order to show how ancient philosophers considered the present problem, and what solutions they offered, we shall analyze the most characteristic, the most complete and most systematic theories, those which have exercised the greatest influence on subsequent thinkers.

Early Period of Greek Philosophy—Stoics —Epicureans.

We do not find in early Greek philosophy any attempt at a systematic treatment of the question. Thought was engaged in a broader field of investigation, that of the primordial constituent elements of the world, and probably much attention could not be devoted to particular questions of psychological life. Moreover, the works of those philosophers have not come down to us; frequently we are obliged to rely on imperfect testimonies of later writers, or simply to infer from their general doctrine what they must have held on a special point.

[1] *Metaphysics*, I., 1, 980a, 22.

[2] *Theætetus*, 155 D.

Memory was commonly explained by the retention of images, effluxes, which, being detached from external objects, came in contact with the sense organs, and produced sensations. Thus for Empedocles, the 'effluvia' (ἀπορρόαί) proceed from the object, enter the pores (πόροι) of the organism, and sensation takes place when they meet the element which corresponds to them, for 'the like is known by the like.'[1]

In the atomistic system of Leucippus and Democritus, external objects constantly produce similitudes of themselves, or 'εἴδωλα'; sensation takes place when this real representation or likeness of the objects comes in contact with the atoms of the soul.

We can also dispose at once of the later theory of the Stoics and of the Epicureans. According to them also, the soul is material.[2] The Stoics explain sensation by saying that it is the impression produced in the soul, either in a strict material sense (τύπωσις ἐν ψυχῇ), as with Cleanthes; or as a change of state in the soul (ἑτεροίωσις ψυχῆς), as with Chrysippus.[3] Memory consists in preserving those characters, or impressions left by sensation. According to the Epicureans also the soul perceives external objects when their 'εἴδωλα' or 'simulacra' come in contact with it, and remembers when it preserves their imprint (τύπος)[4]. We see that this theory of sensation and memory is essentially the same as that of Democritus.

We come now to those writers who have a more explicit doctrine concerning retention and revival of past conscious states. We can divide our historical sketch into two parts, one dealing with the metaphysical, or the spiritual views, the other with the physical and organic theories. Sometimes, it is true, a theory assumes both organic and spiritual factors; then we shall classify it according to the primary and more essential element in the explanation which it proposes.

[1] C. Plato, *Meno,* 76 C. D. Aristotle, *De sens. et sensib., c.* 2; *De gener. et corrupt.,* I., 8, 324 B., 25 seq.

[2] Cf. Eisler's *Wörterbuch der phil. Begriffen und Ausdrücke,* s. v., Seele, p. 673 ff.

[3] Cf. Diogenes Laert., B. VII.

[4] Cf. Lucretius, *De Rerum Natura,* Lib. IV.

1. Retention Attributed to the Soul.

Plato.

We do not find in Plato any theory of memory; yet we know that according to his teaching, memory, in our present condition, is the basis of all true and real knowledge. The soul, before being united to a body, existed as a pure spirit, and in that state acquired knowledge by the contemplation of the only true realities, the 'ideas.' The body is a prison in which the soul is confined against its will and inclination, and which prevents it from contemplating the 'ideas.' We have perceptions through the senses, but they do not give us a true knowledge because their object is changing, contingent. They produce in us faith (πιστις), but not science. Still those perceptions are means of acquiring real science which consists in recalling to memory the knowledge which the soul had stored up in its previous existence, namely, the knowledge of the eternal and immutable ideas of which all realities are a participation. "Man must acquire the understanding of things according to their generic form." To attain this end, many perceptions are necessary, which by reasoning are reduced to unity; and 'this is a recollection of those things which the soul formerly saw, when journeying with God, contemning those things which we now say are, and looking up to what really is.'[1] Sensations, therefore, are the occasions on which knowledge is represented to the mind; it was present before, but could not be recalled. This is a purely spiritual retention, in which the body has no part, since it rather prevents the soul from acquiring science.

There is another memory which preserves the sensations. "One would rightly call memory the preservation of the sensation (σωτηρίαν αἰσθήσεως)."[2] The things which we have seen or heard are imprinted in the soul, and we remember them as long as the image remains.[3] Even these, however, seem to be preserved in the soul itself, not in the organism.

When he tries to give an explanation, Plato has nothing to

[1] *Phaedr.*, 249 B. C. Cf. *Phaedo*, 72 E, 75 C.
[2] *Phileb.*, 34 A.
[3] *Theæt.*, 191 D.

offer but comparisons and metaphors. Memory is a secretary or clerk (γραμματεύς) who writes 'in the souls' the various affections and sensations; or a painter who paints (γράφει) 'in the soul' the images of the things perceived.[1] Elsewhere the soul is compared metaphorically to a tablet of wax, which, in various individuals, is of different size, quality, purity, softness, etc. On this tablet we impress our perceptions by placing it under them, as if we were taking off impressions from rings. As long as that image remains—and this depends on the qualities of the wax—we remember and know; otherwise we forget.[2] In the same dialogue the soul is compared to an aviary, and this again metaphorically: "As before we have constructed I do not know what kind of a waxen figment, so now let us make in each soul a kind of aviary of all kinds of birds."[3] This is empty in the child, but is filled up little by little in proportion as its experience increases.

So, for Plato, both memory (μνήμη) and reminiscence (ἀνάμνησις) are faculties of the soul alone. The body, which had at least an indirect part in the acquisition of our various ideas, seems to have none in their retention and reproduction: "When the soul itself without the body, recalls within itself (ἄνευ τοῦ σώματος αὐτὴ ἐν ἑαυτῇ) that which it has experienced with the body, shall we not call that to remember?—Evidently.—And when, having lost the remembrance of a sensitive perception, or of science, it reconsiders it itself in itself, we also call all these reminiscences and memories."[4]

St. Augustine.

In the philosophy of St. Augustine also, it is the soul and not the body that remembers and preserves the various impressions in the form of images. This function is always attributed to the 'animus,' not however to the intellect, or 'mens.' For between sensuous perception and intellectual knowledge, there is a third kind of perception (visio), namely the spiritual,

[1] *Phileb.*, 39 A. B.
[2] *Theæt.*, 191 C. D.; 194 E.
[3] *Theæt.*, 197 D.
[4] *Phileb.*, 34 B.

because 'whatever is not a body, and yet is something, can aptly be called spirit, and the image of an absent body is not a body, although it is similar to it.'[1] This spirit, therefore, 'is a faculty of the soul inferior to the intellect, and where the similitudes of things are preserved (*ubi corporalium rerum similitudines exprimuntur*).'[2] Such retention supposes sensation: "They who have had no color sensations have no images of color."[3]

There is also an intellectual memory which contains our knowledge of the various sciences of literature, logic, dialectics, etc. It differs from the other because it retains, not the images of things, but things themselves that are intelligible and cannot be represented by images. Indeed when I hear that there are three kinds of questions that can be asked about any object, viz., its existence (an sit), its nature (quid sit) and its qualities (quale sit), the sounds are perceived by the ear, and their images are kept in memory. But none of the senses has ever perceived the things themselves which the sounds signify. It is not therefore their images but the things themselves that are in my mind, in the 'remotest corners' of my memory. As they could not enter the soul through the senses, they must have pre-existed in the mind. How they came there, says St. Augustine, let others say if they can; for me, I confess that I do not know.[4]

Memory, as we have said, is a function of the soul.[5] It has, however, a seat in the organism, in one of the ventricles of the brain. This, at least, is a teaching to which St. Augustine refers approvingly and against which he proposes no objection. But he himself neglected entirely the physiological aspect of memory. When he tries to explain memory, he finds nothing but metaphors. It is a treasury, an immense hall or palace, a large, even a boundless recess. It has fields, cells, storerooms, caverns, and no word seems adequate to express its marvellous

[1] *De Genesi ad litt.,* XII., 7.
[2] *Ibid.,* XII., 9.
[3] *Epistola VII. ad Nebridium,* III., 6.
[4] *Confess.* L. X., cc. 9, 10, 11; cf. *De Trinit.,* XIV., ch. VII., §10.
[5] Cf. also *De Musica,* L. I., IV., 8, and *De Quantitate animæ,* c. V., 8.

functions. And even—an expression which would sound bold to modern ears—'memoria quasi venter est animi.'[1]

If we now ask: What is it that memory preserves? What are those images which it treasures up? We find a very unsatisfactory answer. The images are not material realities as the εἴδωλα of Democritus or of Epicurus, but they are ideal.[2] They "are perceived by the spirit just as bodies are perceived by the bodily organs."[3] But exactly in what the images consist, and what their nature is, according to Augustine, we can hardly understand.[4]

Leibniz.

Coming to the modern period of the history of philosophy, the first author we have to mention is Leibniz. He says of his own theory that it rather resembles that of Plato, and opposes it to Locke's system which, he says, is rather Aristotelian.[5] There are in our souls innate ideas and principles which are not always conscious; they may be merely 'perceptions,' not 'apperceptions.' Although in some passages he seems to understand them as real ideas and perceptions, yet probably he conceived them as dispositions, habits, faculties, by which we readily and from the very beginning of our life apprehend such ideas and principles.[6] They are more than 'tabula rasa,' since they enable the mind to draw ideas out of itself: 'pour les tirer lui-même de son propre fonds.'[7]

Owing to the law of preëstablished harmony of body and soul, innate ideas do not become conscious without the help of the senses, but there may be no necessary connection between

[1] *Conf.* X., cc. 8, 9, 14, 17.

[2] "Imagines, id est, incorporeas similitudines corporum, incorporaliter mandat (mens) memoriæ, unde cum voluerit et potuerit velut de custodia productas atque in conspectum cogitationis exhibitas iudicet." Epist. CXLVII. (Paulinæ) XVI. Cf. Epist. CLXII. (Evodio), No. 4.

[3] *De Genesi ad litt.*, L. XII., 12.

[4] *Epist.* CLXII., 4.

[5] *Nouveaux essais.* Avant-propos.

[6] "Les idées et les vérités nous sont innées comme des inclinations, des dispositions, des habitudes, ou des virtualités naturelles, et non pas comme des actions." *Op. cit.*, Avant-propos.

[7] *Op. cit.*, L. I., Ch. I., §5; cf. *ibid.*, §II., and Ch. III., §18.

the sensation and the abstract idea which it awakens in the mind.[1]

All knowledge is preserved in the mind, and this in two ways, which are repeated from Locke: contemplation, when we keep ideas in consciousness; and memory, when they are recalled after a disappearance.[2]

To explain memory, Lebniz rejects and ridicules the theory of a mere faculty, which he attributes to Locke. This faculty it nothing but a kind of scholastic entity and absolutely unintelligible. Something of the past impressions must remain in the soul, viz., dispositions on which the mind's power can be exercised, and this Leibniz calls a disposition or a trace.[3] The persistence of these traces is not impossible although they are unconscious, and notwithstanding the fact that they may be too weak to revive the past idea.[4] Moreover, they always remain in us, so that absolute forgetfulness is impossible. When the idea has vanished from consciousness, the germs of it are preserved as unconscious perceptions.[5]

Habit is explained on the same principles. Nothing that has been entirely ceases to exist: 'le présent est gros de l'avenir et chargé du passé.'[6] Habits are nothing but past actions them-

[1] "C'est par une admirable économie de la nature que nous ne saurions avoir des pensées abstraites qui n'aient point besoin de quelque chose de sensible, quand ce ne serait que des caractères, tels que sont les figures des lettres et les sons, quoiqu'il n'y ait aucune connexion nécessaire entre tels caractères arbitraires et telles pensées." *Op. cit.*, L. I., ch. I., §5; cf. Avant-propos and L. I., ch. III., §18.

[2] *Op. cit.*, L. II., ch. X., §1.

[3] "Je m'étonne que vous vous puissiez toujours payer de ces puissances ou facultés nues. . . . Il faudrait expliquer un peu plus distinctement en quoi consiste cette faculté, et comment elle s'exerce, et cela ferait connaître qu'il y a des dispositions qui sont des restes des impressions passées, dans l'âme aussi bien que dans le corps. . . . Et si rien ne restait des pensées aussitôt qu'on n'y pense plus, il ne serait point possible d'expliquer comment on en peut garder le souvenir; et recourir pour cela à cette faculté nue, c'est ne rien dire d'intelligible." *Op. cit.*, L. II., ch. X., §2.

[4] "Je ne vois aucune nécessité qui nous oblige d'assurer qu'il ne reste aucune trace d'une perception, quand il n'y en a pas assez pour se souvenir qu'on l'a eue." *Op. cit.*, L. I., ch. III., §18.

[5] "Il n'est point raisonnable que la restitution du souvenir devienne à jamais impossible, les perceptions insensibles servant encore ici à en garder les semences." *Op. cit.*, L. II., ch. XXVII., §14.

[6] *Op. cit.*, Avant-propos.

selves, persisting virtually, remaining in a latent condition, and determining subsequent actions by determining the relations of a monad to the others. Hence, says Leibniz, if the theory of transmigration of souls was true, if souls could pass from one body to another, the same individual would always continue to exist in Nestor, Socrates or any other man. He could even manifest his identity to anyone who had the power to penetrate sufficiently into his nature; for he has kept impressions and characters of all that Nestor or Socrates has done. The soul is an immaterial being, or spirit, and such a being 'preserves impressions of all that has happened to it in the past, and even has forebodings of all that will befall it,' although it may not be able to distinguish them clearly.[1]

Scottish Philosophers: Reid, Stewart and Hamilton.

The philosophers of the Scottish school consider only the mental side of the phenomena of retention and reproduction. Their individual views do not agree in all points, and their explanations differ. But they are all at one on the fundamental principle: the explanation must be on purely psychological grounds; physiology can be of no help, and hence must not even be taken into consideration.

Reid.

We know, says Reid, that whenever we experience a sensation, there is some impression and change produced in our organs. The organ in turn produces some change in the nerve; and this some change in the brain. Whatever be the nature of these impressions, it is certain that we perceive nothing unless they take place, but we can give no reason why it is so. It is a fixed law of nature; the Supreme Being has seen fit that it shall be so, and this is all we know on the matter.[2] The impressions received in the brain can in no way account for memory. In the first place, 'if the impression upon the brain be insufficient to account for the perception of objects

[1] *Op. cit.*, L. II., ch. XXVII., §14.

[2] *Essays on the Powers of the Human Mind—Intellectual Powers,* Essay II., ch. II.

that are present, it can as little account for the memory of those that are past.' Moreover, 'there is no evidence, nor probability . . . that the impression made upon the brain in perception remains after the object is removed.' For the brain does not appear more fitted to retain it than the organ and nerve. And even if the brain preserved it, then 'sensation and perception should be as permanent as the impression upon the brain, which is supposed to be their cause.' Granting further that actual perception could disappear, even if the impression remained, then we would have something impossible, viz., the same cause would produce two different effects: sensation and memory; for memory is 'an operation essentially different both from sensation and perception.' It is possible and even 'very probable' that memory depends upon the conditions of the brain, because nature may have subjected us to this law; but after many attempts of philosophers to explain memory on a physiological basis, it 'remains unaccountable, and we know as little how we remember things past as how we are conscious of the present."[1]

Memory is therefore an 'original faculty' of which no explanation can be given; it is the immediate perception of the past. It is just as difficult to explain as would be the prescience of the actions of a free agent. The same argument applies to both cases: what is past did certainly exist, and what is future will certainly exist. "The past was, but now is not. The future will be, but now is not. The present is equally connected or unconnected with both." Why we possess the faculty of directly perceiving the present through consciousness, the past by memory, but not the future—no other reason can be given than the will of God.[2]

Dugald Stewart.

Dugald Stewart agrees with Reid in rejecting 'the various theories which have attempted to account for memory by traces or impressions in the sensorium.' They are 'obviously too unphilosophical to deserve a particular refutation.' As an example of such physiological theories, Dugald Stewart quotes in

[1] *Op. cit.*, Essay III., ch. VII.

[2] *Op. cit.*, Essay III., ch. II.

a note a passage from Malebranche[1] which we will have to mention later. The decrease of memory-power, which is the common effect of old age, has for its principal cause the lessening of the power of attention, which in turn may result from some change in the organism. Memory is the 'capacity of retaining knowledge in the mind, and a power of recalling it to our thoughts when we have occasion to apply it to use.' Those ideas which were latent in the mind are revived either spontaneously or in consequence of an effort of the will. Not all ideas, however, remain in memory; 'by far the greater number vanish without leaving a trace behind them,' whilst the others 'by their accumulation lay a foundation for our perpetual progress in knowledge.' The reason of this difference is explained by the dependence of memory upon attention and association of ideas.[2]

Habit is explained by memory and association. It expresses 'that facility which the mind acquires in all its exertions, both animal and intellectual, in consequence of practice.' It is not, as Reid claimed, a mechanical power, which, like instinct, operates 'without will or intention, without thought,'[4] but it is explained by the rapidity of the succession of our ideas and volitions, which recall one another because they have frequently been united and repeated together. All the acts of the will which were conscious before the habit was acquired, are conscious even after, but they succeed one another with such ease and rapidity that they do not leave any trace, and cannot be recalled by memory.[5]

Hamilton.

The theory of habit proposed by Dugald Stewart is rejected by Hamilton, because 'it supposes a consciousness and no memory . . . which violates the fundamental law of our intellectual being.' It is moreover 'altogether hypothetical . . . illegitimate and superfluous.' Hamilton explains habit by the

[1] *Recherche de la Vérité,* L. II., P. I., ch. 5 and 6.
[2] *Elem. of the Philos. of the Human Mind,* ch. VI., sect. I.
[3] *Op. cit.,* ch. V., p. I., sect. 1.
[4] Reid, *Active Powers,* Essay III., p. I., ch. 3.
[5] *Op. cit.,* ch. II.

theory of latency, or unconsciousness of certain mental acts: 'there are acts of mind so rapid and minute as to elude the ken of consciousness.' This is in the main the theory of Leibniz, without his obscure terminology. Leibniz, Hamilton says, violated the universal usage of language when he called those latent modifications 'obscure ideas, obscure representations, insensible perceptions, perceptions without apperception, etc.,' since all these expressions involve the notion of consciousness.[1]

With regard to memory, Reid's theory, according to which memory is the immediate knowledge of the past, 'is not only false, but it involves a contradiction.' To know an object immediately is to know it in itself, and therefore this object must actually be in existence. A past object can only be known 'in and through a present object,' or a present state of mind which we are conscious of as relative to another which has been. Memory is 'at best only a mediate knowledge of the past; while in philosophical propriety it is not a knowledge of the past at all, but a knowledge of the present and a belief of the past.'[2]

Knowledge is kept in the mind in an unconscious state, and is 'lying dormant,'[3] so that the mind contains 'far more latent furniture than consciousness informs us it possesses.'[4] Nay, 'the infinitely greater part of our spiritual treasure lies always beyond the sphere of consciousness, hid in the obscure recesses of the mind.' We know that we can revive cognitions which we formerly had. Therefore, 'that in the interval, when out of consciousness, these cognitions do subsist in the mind is an hypothesis . . . which we are . . . necessitated by the phænomena to establish.'[5]

Finally we must seek for an explanation in the mind itself. Physiological hypotheses cannot be taken seriously; 'indeed all of them are too contemptible even for serious criticism.' But on the contrary, retention 'is so natural on the ground of the

[1] *Lectures on Metaphysics,* Lect. XVIII., XIX.
[2] *Op. cit.,* lect. XII.
[3] Lect. XXXI.
[4] Lect. XVIII.
[5] Lect. XXX.

self-energy of the mind that we have no need to suppose any special faculty for memory.' Retention is implied in the very conception of the mind as self-activity. The reason which Hamilton quotes from Schmid is that the mental activity, or act of knowledge, being 'an energy of the self-active power of a subject one and indivisible, a part of the ego must be detached or annihilated if a cognition once existent be again extinguished.'[1] Hence the true mystery is not retention and memory, but forgetfulness.

Herbart.

Leaving the Scottish school, we pass to Germany. Of Herbart we shall say but little. However interesting and important his views on our subject may be, a complete exposition of them would lead us too far afield. In order to give a satisfactory account of them it would be necessary to enter into the details of his whole philosophical system, of which they are an essential part. He rejects all innate ideas and faculties, and explains retention in a manner which has many points of resemblance with the Leibnizian theory. All conscious states are presentations; feelings, affections, emotions, desires, passions, are all of the same nature as representative ideas. Ideas which are not in opposition with one another, but which are either entirely homogeneous and similar in quality, or entirely disparate, blend together in a single complex presentation. But ideas which are opposed, totally or partially, tend to arrest each other, *i. e.*, to exclude each other from consciousness, in proportion to their respective intensity, and to the degree of their opposition. So arrest (Hemmung) may mean simply a diminution in the intensity of a presentation, or its complete exclusion from consciousness.

The presentations which, at any given moment, are present to consciousness are said to be above the threshold of consciousness, and those which have been completely arrested are said to be below this threshold (Schwelle des Bewusstseins). But even those that have completely disappeared from consciousness still remain in existence, as 'tendencies' or efforts to

[1] Lect. XXX.; cf. also, in addition to the places referred to, lect. XXXII.

become conscious; and they are ready to reappear as soon as the 'arresting' conditions are removed. We are not told exactly what those tendencies are, but we know that they are based on the essential activity of all 'reals,' which consists in their self-preservation (Selbsterhaltung). The rising and sinking of perceptions, owing to their antagonistic forces, their disappearance and reappearance, can be mathematically determined, since it depends on the relative degrees of intensity of, and of opposition between, those presentations. Herbart gives the principles and laws of this determination.[1]

Beneke.

According to Beneke, none of those psychical products which have reached a certain degree of perfection ever ceases entirely to exist. Every one of them, 'after it has disappeared from consciousness, or from within the sphere of active psychical development, is preserved in the unconscious or inner soul, from which it may afterwards enter again into the conscious mental development and be reproduced.'[2] That which thus persists out of consciousness we call a trace (Spur), if we refer it to the mental development which continues to exist innermost; and we call it ground-work, germ (Angelegtheit), in reference to those developments which take place on this foundation (Grundlage), or have their starting point in it. Of these traces 'we know nothing, except through their actual reproduction.'[3] We cannot say what place they occupy; "there is no 'where' for them" and they are connected with no bodily organ. "For the trace is that which comes between the production of a mental activity (*e. g.*, sensuous perception) and its reproduction (*e. g.*, as recollection). As these two acts are psychical, it follows that we can conceive of these traces only in a psychical form."[4]

[1] Cf. especially *Psychologie als Wissenschaft neu gegründet auf Erfahrung, Metaphysik und Mathematik;* also *Lehrbuch zur Psychologie,* Sämmtliche Werke, V., VI. The reader may consult: Stout in *Mind,* XIII., 1888, pp. 321 ff., 473 ff.; XIV., 1889, pp. 1 ff., 353 ff.; J. Ward in *Encyclopedia Britannica,* art. 'Herbart'; Stout and Baldwin in *Diction. of Philos. and Psychol.,* art. 'Herbartianism.'

[2] *Lehrbuch der Psychologie als Naturwissenschaft,* ch I., §27.

[3] *Ibid.,* §28.

[4] *Ibid.,* §29.

According to the writers mentioned so far, retention is, if not exclusively, at least for the most part, a function of the soul. There may exist between their philosophical systems the widest differences; even on the present question some speak of the persistence of the ideas themselves, others of the persistence of traces, others even of mere native faculties. But they all agree in placing those ideas, traces, faculties, in the soul itself. Physiology throws no light on the problem, for the organism can have no direct part in the retention of what has been a conscious process.

But the opinion which bases its explanation on the organism has found defenders no less numerous and no less able than the other. We must now speak of the physiological theories, *i. e.*, of those for which the body is, not the only factor perhaps, but certainly the more important factor in retention and reproduction of conscious processes.

2. Retention Attributed to the Organism.

Aristotle and Scholastics.

Plato observing that all the objects which we perceive around us are concrete, individual, changing, imperfect and at the same time that there are in us ideas of the abstract, universal, immutable, infinite, saw no other means to explain the presence of ideas in us than by saying that they are innate. That knowledge which it is impossible for the soul to acquire now is possessed by the soul when it comes into the world. Such knowledge was acquired in a better state and condition in which the soul has been, in a suprasensuous, heavenly world, '*ἐν οὐρανίῳ τόπῳ*,' and is now preserved in a latent state, until it is aroused to consciousness by sensuous perception.

This did not meet with the approval of Plato's disciple, Aristotle. Experience does not reveal to us any innate ideas; they must be rejected. All the knowledge which man possesses he acquires little by little, step by step; even the highest and most abstract notions are acquired by the mind in the present life. We shall try to analyze Aristotle's views as far as it is necessary for our present purpose. But as we also have to

speak of the medieval philosophers, it seems better not to separate them from their master, Aristotle. Their philosophy was essentially based on Aristotle's doctrine; he was 'the philosopher,' and his authority alone was an argument. Although they added to Aristotle's philosophy, modified it, adapted it to their purpose, yet the main lines are the same. Hence we shall speak here of Aristotle and the scholastics, or rather of Aristotle and St. Thomas, for to mention all the medieval philosophers would be too long and tedious, and would be useless. No one will question the fact that St. Thomas was of all the greatest, and that he is the best and most widely accepted representative of all. Moreover we must notice that on the essential points of our problem they were all agreed, however great their differences of opinions may have been on other questions.

(*a*) General Theory of Knowledge.

Man comes into existence without any knowledge, but only with the power to acquire it. How does he acquire knowledge? As our act of perception is in us and remains in us, it follows that the known object must in some manner be in ourselves, must come in contact with our cognitive faculty, must be in a certain manner present within the knowing subject: 'Cognitio contingit secundum quod cognitum est in cognoscente,' 'Omnis cognitio fit secundum similitudinem cogniti in cognoscente.'[1] For vision and perception, both sensitive and intellectual, two conditions are required: the power to see, and the union of the object with that power. For vision (*i. e.*, perception in general) takes place only when the thing seen is in some manner in the seeing subject: 'Non fit visio in actu nisi per hoc quod res visa quodammodo est in vidente.'[2]

What is meant by this 'quodammodo'? The thing itself does not enter the mind, but only some form of it; not as the εἴδωλα of Democritus, or the ἀπορρόαι of Empedocles, but as a 'species intentionalis.' "The stone itself does not enter the soul, but only its form."[3] The faculty is of itself indetermined

[1] St. Thomas, *Contra Gentes,* Lib. II., cc. 77 and 98.
[2] *Summa theologica,* P. I., quæst. 12, art. 2.
Arist., *De anima,* III., 8, 431b, 29.

to perceive several objects, and must be determined by some specific form or 'species.' The species is to some extent similar to the object from whose activity it proceeds; not indeed as a material copy or a physical miniature of it, but it is ideal, mental, intentional. In itself, as a reality, it is like the *potentia* in which it is received and which it modifies: 'quidquid recipitur, per modum recipientis recipitur.' But as a medium of knowledge, it is like the object which it determines the faculty to know.[1] The *species* is nothing but the stimulation of the faculty by the object, expressed in more metaphysical terms. The species which determines the faculty and gives it its 'actus' was called 'species impressa.' When the act of perception itself is performed the idea or representation which is formed was called 'species expressa.' It is important to notice that the species is not what we know, but only a necessary condition; we know the objects themselves immediately, once the cognitive faculty has received from their action the necessary determination.[2]

The difference between cognitive and non-cognitive beings consists precisely in this, that the latter have only their own 'form,' while the former can receive in themselves the 'forms' or 'species' of other beings.[3] And Aristotle tells us that plants do not have sensation because they have no principle capable of receiving the sensible forms.[4]

[1] "Similitudo aliquorum duorum ad invicem potest dupliciter attendi. Uno modo secundum convenientiam in ipsa natura, et talis similitudo non requiritur inter cognoscens et cognitum. . . . Alio modo quantum ad repræsentationem, et hæc similitudo requiritur cognoscentis ad cognitum." *Quæst. disp. De verit.* quæst. 2, art. 3, ad 9.

"Forma lapidis in anima est longe alterius naturæ quam forma lapidis in materia; sed in quantum repræsentat eam, sic est principium ducens in cognitionem eius." *Ibid.,* quæst. 8, art. 11, ad 3.

[2] Cf. *Summa theol.,* P. I., q. 12, a. 9; q. 14, a. 5; q. 85, a. 2. *Qq. disp. De spiritual. creaturis,* art. 9, ad 6, and *De verit.,* q. 10, art. 8, ad 2, etc. We will explain in the last chapter what the scholastics meant by faculties.

[3] "Cognoscentia a non cognoscentibus in hoc distinguuntur quia non cognoscentia nihil habent nisi formam suam tantum, sed cognoscens natum est habere formam etiam rei alterius, nam species cogniti est in cognoscente." *Summa theol.,* P. I., q. 14, a. 1.

[4] *De anima,* II., ch. 12, 424a, 32 ff.

(*b*) Two Kinds of Knowledge.

The general theory of knowledge which we have just described applies to both intellectual and sensitive perception. But the process and mode of action in both cases is different, since the intellect is essentially inorganic, while sensation is essentially organic. The essence of a being which can think (intellectual knowledge) is different from the essence of one which is only sensitive, since 'the nature of sensation is different from that of thought.'[1]

Sensation is a change, a movement in the sense organ which derives its sensitive power from the soul which is united to it.[2] The 'species' which determines the organ is not an efflux from the thing itself, for the organ receives 'the forms without the matter, as wax receives the impression of the ring without the iron or the gold.'[3] Hence the 'species sensibilis' is sometimes called by St. Thomas 'spiritualis' to indicate that its nature is different from that of the material object itself, and that it is received not simply in matter but in the 'animated body,' the soul being the principle of all sensitiveness. It is also sometimes called 'materialis' to show that it is not received in the soul alone, but also in the material organ. In a word, to-day we should call it *psycho-physical.*[4]

The intellectual faculties on the contrary are spiritual in themselves, yet depend extrinsically on the organism for the exercise of their functions. From sensible images the attentive activity of the intellect (intellectus agens, *νοῦς ποιητικός*), by a process of 'abstraction, illumination,' forms the 'species intelligibilis' which determines the mind itself (intellectus possibilis, *νοῦς παθητικός*), to form abstract, universal, spiritual concepts.

[1] Aristotle, *De anima,* II., c. 2, 413b, 30.

[2] *Op. cit.,* II., ch. 5, 416b, 33.

[3] "Καθόλου δὲ περὶ πάσης αἰσθήσεως δεῖ λαβεῖν ὅτι ἡ μὲν αἴσθησίς ἐστι τὸ δεκτικὸν τῶν αἰσθητῶν εἰδῶν ἄνευ τῆς ὕλης οἷον ὁ κηρὸς τοῦ δακτυλίου ἄνευ τοῦ σιδήρου καὶ τοῦ χρυσοῦ δέχεται τὸ σημεῖον, λαμβάνει δὲ τὸ χρυσοῦν ἢ τὸ χαλκοῦν σημεῖον ἀλλ' οὐχ ᾗ χρυσὸς ἢ χαλκός." *Op. cit.,* II., 12, 424a, 17.

[4] Cf. *Summa th.,* P. I., q. 78, a. 3; *Qq. disp. De verit.,* q. 2, a. 5, ad 2. *Comment. de anima,* lect. 12.

(*c*) Retention.

The *species* which has determined the faculty, either sensitive or intellectual, to its operation, does not entirely disappear after the act of perception. It remains as a state (habitus), or permanent '*disposition*' of the organ of sensation, or of the spiritual intellective faculty.[1] Aristotle speaks of movements, of residua left in the sense organs, which are the condition of memory: 'Sensations come to the soul from without, but memory comes from the soul which goes back to the movements and the impressions left in the sense organs.'[2] This impression is compared by Aristotle to a kind of picture left by the sensation in both the soul and the body, the possession of which we call memory. "The movement which takes place in sensation, imprints a kind of character (τύπος) of the sensation in the same way as do those who make an imprint with their signet rings." Hence the difference of memory in various individuals. Some, being too much agitated or in a passion, keep no impression, as though the seal were applied to flowing water. Others do not preserve any image because of the hardness of the part which must receive the impression, or because on the contrary it is too moist and too soft. Recognition is explained because the soul considers the image, not as it is in itself, but as representing something else, and being a copy of an object. In the same manner, we can consider the picture of an animal either as something absolute or as something relative, a representation, an image of something else.[3]

The scholastics also teach that the 'phantasma' is a 'habitus,' a disposition, a modification of the sense organs. "Phantasmata sunt similitudines individuorum, et existunt in organis corporeis." (The word 'similitudo' must be understood as 'intentionalis,' in the same manner as for the species.) Those

[1] "Potentia sensitiva per similitudines sensibilium reducitur in actum dupliciter. Uno modo incomplete per modum dispositionis, quando scilicet species sensibiles sunt in ea ut dispositiones. . . . Alio modo perfecte, quando scilicet species sensibiles actu informant potentiam sensitivam. . . . Et similiter in intellectu. . . ." *Quodlibeta,* 7, art. 2.

[2] *De anima,* I., 4, 408b, 17.

[3] Arist., *De memoria et reminiscentia,* I., 450 a. b.

residua of sensation do not belong to the soul alone, but to the soul-and-body, to the 'coniunctum.'[1] Memory is the 'treasure of intentional species.'[2]

Not only are the 'species sensibiles' preserved in the organism, but the 'species intelligibiles' are also preserved in the intellect, and enable us to remember our intellectual concepts.[3]

St. Thomas shows against Avicenna that it is possible for the intellect to preserve the 'species.' Indeed if it is possible for the body to preserve impressions, why should it not be possible for the soul? St. Thomas knew of the metabolism of the organism, of its continually undergoing change. Its materials are gradually renewed, 'paulatim consumitur et restauratur'; the parts which compose it come and go, 'fluunt et refluunt'; they are decomposed under the influence of heat and replaced by others, 'materia partium et resolvitur per actionem caloris naturalis, et de novo adgeneratur per alimentum.'[4] This being the case, if nevertheless we admit that the impressions remain in the senses, *a fortiori* it is possible for the intellect which belongs to the spiritual substance of the soul, and whose nature is not subject to such changes, to preserve the 'species intelligibiles.'

Consequently the species can be in the intellect: (1) 'In potentia tantum,' *i. e.,* when one has the faculty of intelligence, but does not exercise it. (2) 'In actu perfecto' when they actually determine the intellect to an act of perception. (3) 'Medio modo' or 'in habitu,' when after its operation, the intellect retains in itself the *species,* to use them when it chooses.[6] It must be noticed, however, that the intellect depends on the senses and on the conditions of the organism, not

[1] *Comment. in* Arist., *De mem. et rem.,* lect. 3.

[2] *Summa th.,* P. I., q. 78, a. 4.

[3] "Καὶ εὖ δὴ οἱ λέγοντες τὴν ψυχὴν εἶναι τόπον εἰδῶν πλὴν ὅτι οὐτε ὅλη ἀλλ' ἡ νοητικὴ οὔτε ἐντελεχείᾳ ἀλλὰ δυνάμει τὰ εἰδη." Arist., *De anima,* III., ch. 4, 429a, 27.

[4] *Summa th.,* P. I., q. 119, a. 1, ad 2; *Contra gent.,* IV., c. 81, ad 4.

[5] "Intellectus enim est magis stabilis naturæ et immobilis quam materia corporalis. Si ergo materia corporalis formas quas recipit non solum tenet dum per eas agit in actu, sed etiam postquam per eas agere cessaverit, multo fortius intellectus immobiliter et inamissibiliter recipit species intelligibiles." *Summa th.,* P. I., q. 79, a. 6; cf. *Cont. gent.,* II., 74; *De verit.,* q. 10, a. 2 and q. 19, a. 1.

[6] Cf. *Qq. disp. De animâ,* a. 15, ad 17; *Summa th.,* P. I., q. 79, a. 6, ad 3.

only to acquire knowledge, but even to recall it; so that the exercise even of intellectual memory supposes some sense perception or image. This is the clear teaching of Aristotle and St. Thomas, as we shall explain more in detail later on (ch. V., p. 155 ff.), and for this reason their theory is principally physiological.

From the preceding remarks we can understand what science or knowledge is. A man does not have actually present in consciousness all that he is said to know; he knows that which has been formerly present to his consciousness, and which he can now recall. It is an 'habitual' state. "Non potest intellectus simul multa *actu* intelligere, potest tamen simul *habitu* multa scire."[1] And this power of preserving our knowledge is what we call memory.[2]

(*d*) Habit and Disposition.

We have seen that the species were said to remain in the faculties as habits or dispositions. Aristotle defines memory as the habit (*i. e.*, the possession) of knowledge.[3] Habit and disposition differ only in degree, the former being more lasting and firm, the latter being more easily removed and changed. So science and virtue (justice, temperance, etc.) are habits; heat, cold, health, sickness, are dispositions. All habit is also a disposition, but not all dispositions are habits.[4]

In the same manner St. Thomas holds that habits and dispositions are not two distinct kinds, but that a disposition can be strengthened and become a habit.[5] Habit has different meanings; it may be a state, a condition of body or of soul, a permanent modification in the constitution of the being itself; or it may be the 'habitus operativus' which inclines to a certain

[1] *Summa th.*, 1a 2ae, q. 54, a. 1, ad 3.

[2] "Species intelligibiles in intellectu possibili remanent post actualem considerationem, et harum ordinatio est habitus scientiæ . . .; et hæc vis qua mens nostra retinere potest species intelligibiles post actualem considerationem, memoria dicitur." *Qq. disp. De verit.*, q. 10, a. 2.

[3] *De mem. et rem.*, I., 449b, 24.

[4] *Categ.*, VIII., 8b, 25 ff.

[5] *Summa th.*, 1a 2ae, q. 49, a. 1 and a. 2, ad 3; q. 88, a. 4, ad 4. *Qq. disp. De malo*, q. 7, a. 2, ad 4.

action or class of actions. The preservation of the species is called a habit. Operative habit has many points of resemblance with the species; like it, it is a determination of the active faculty to a certain action; like it, it is, in a way, intermediate between the faculty and its action.[1] It has a double effect: it removes obstacles, and it impels directly to action.[2] Its effects are uniformity of action, readiness to act, pleasure in acting.[3]

Descartes.

For Descartes, perception, even sensitive, is the act of the soul alone. The means of communication between the external world and the soul—a spiritual substance located in the pineal gland—are the animal spirits, which are like a pure flame, made of the most subtle parts of the blood rarefied by heat in the heart.[4] They are in constant motion; they bring to the soul external impressions, and move the body according to the soul's command.[5]

The animal spirits leave traces in the organism and these explain memory and habit, imagination and hallucination. For 'whatever the soul perceives by means of the nerves can also be represented to it by the fortuitous course of the spirits,' although this representation is generally weaker than the others; it is like the shadow and the picture of them. Sometimes, however, the picture is as vivid as the original, and we take our imaginations for realities.[6]

When the soul wants to remember, it directs the spirits toward the traces left by the object.[7] Those traces or 'species' which are necessary to memory are not, at least generally, left in the pineal gland itself, because they would interfere with its

[1] *Summa th.*, 1a 2ae, q. 71, a. 3.

[2] *Qq. disp. De malo*, q. 4, a. 2, ad 4; *Summa th.*, 1a 2ae, q. 88, a. 3.

[3] *Summa th.*, 1a 2ae, q. 78, a. 2.

[4] *Les passions de l'âme*, I., 10.

[5] *De l'homme* (ed. Cousin), Vol. IV., p. 345 ff.

[6] *Passions*, P. I., A. 26.

[7] "Lorsque l'âme veut se souvenir de quelque chose, cette volonté fait que la glande, se penchant successivement vers divers côtés, pousse les esprits vers divers endroits du cerveau, jusques à ce qu'ils rencontrent celui où sont les traces que l'objet dont on veut se souvenir y a laissées." *Passions*, I., 42.

normal movements; they are left in the whole brain and even in other parts of the body, 'as the habit of a lute-player is not in his head only, but also partly in the muscles of his hands.'[1]

From this passage we see that Descartes admitted a close relation between memory and habit, and he attributed to them a common origin and genesis. The whole brain is the organ of memory, but especially its anterior parts. And Descartes repeats that all nerves and muscles can be said to serve memory, so that, *e. g.*, 'a lute-player has a part of his memory in his hands, because the ease and facility of bending and disposing his fingers in various ways, which he has acquired through habit, helps him to remember those passages for the execution of which he has to use them in such a manner.'[2]

The traces left in the organism and especially in the brain are in themselves purely *physical* and *mechanical.* But they have a *psychical result* when the animal spirits, coming through the same pores as formerly, act on the soul in the same manner as before. Their nature is not clearly explained by Descartes; they are described as a facility in opening again, a modification, an enlargement of the pores or little canals through which the spirits have passed already; so that by being opened frequently they become, as we should say to-day, paths of least resistance. Hence 'the spirits enter those pores more easily and produce in the gland a special movement which represents to the soul the same object, and shows that the object is that which it wishes to recall.'[3] Elsewhere Descartes compares organic traces to the folding of a piece of paper, which produces an aptitude and tendency to be folded again in the same place and manner. "As to the species which are preserved in memory, I imagine that they are nothing else but the folds which are preserved in a sheet of paper after it has been once folded."[4]

Not all vestiges are able to produce memory; for in order to have memory it is not sufficient to have observed a thing in our mind and to have kept traces of it in the brain by means of

[1] *Lettres,* Vol. VIII., p. 202.
[2] *Lettres,* Vol. VIII., p. 215, 216.
[3] *Passions,* I., 42; cf. also *De l'homme.*
[4] *Lettres,* Vol. VIII., p. 201, and Vol. IX., p. 167.

which it is recalled, but it is necessary to perceive the relation between the former perception and its present reproduction. One may be an involuntary and unconscious plagiarist.[1] Only such vestiges produce memory as are able ' to give the soul to know that they have not always been in us, but that they have been imprinted formerly as new.'

How then shall we know that an idea is new, or that it has already appeared in consciousness? When an idea appears for the first time the mind must make use of a 'pure conception' (mentem intellectione pura uti debuisse), by means of which it could be aware of the newness of such an idea, for 'there can be no bodily vestige of it.' When therefore a man has a new idea and is aware that it is new, 'I call this second perception reflexion, and it must be ascribed to the understanding, although it is so closely united to the sensation that both take place at the same time and do not even appear to be distinct from each other.'

In addition to the traces left in the brain and by means of which the soul comes to the actual memory of the things it has perceived through the senses, there are in the soul itself purely psychical dispositions, for there is an intellectual memory and there are purely mental habits ' which depend on the soul alone.' These are explained by vestiges which remain ' in thought itself.' Their nature is quite different from that of bodily traces, and cannot be explained by any examples in material things.[2]

Locke.

Locke distinguishes contemplation, or the actual keeping in view of an idea in the mind, from memory, which is the power

[1] "Requiritur ut agnoscamus, quum secunda vice occurrit, hoc ideo fieri quod antehac a nobis fuerit percepta: sic saepe poetis occurrunt quidam versus, quos non meminerunt se apud alios unquam legisse, qui tamen tales iis non occurrerent nisi alibi eos legissent." *Lettres,* Vol. X., p. 158.

[2] "Pour la mémoire, je crois que celle des choses matérielles dépend des vestiges qui demeurent dans le cerveau . . . et que celle des choses intellectuelles dépend de quelques autres vestiges qui demeurent en la pensée même; mais ceux-ci sont d'un tout autre genre que ceux-là, et je ne les saurais expliquer par aucun exemple tiré des choses corporelles qui n'en soit fort différent." *Lettres,* Vol. IX., p. 167, Vol. VIII., p. 216.

to revive ideas after they have disappeared and have been laid out of sight. Then he proposes his theory of memory as follows: " Our ideas being nothing but actual perceptions of the mind, which cease to be anything when there is no perception of them, this laying up of our ideas in the repository of memory signifies no more than this, that the mind has a power in many cases to revive perceptions. . . . Our ideas are said to be in our memories when indeed they are actually nowhere, but only there is an ability in the mind when it will to revive them again."[1]

In this passage Locke seems to imply that ideas leave no trace whatever in the mind, since they ' cease to be anything,' and the mind is obliged, 'as it were, to paint them anew on itself.' This passage led Lebniz to attribute to Locke the opinion according to which memory would be explained solely by a power or faculty (faculté nue) of the mind to revive ideas, without anything of these remaining in the mind.

When, however, Locke enters into a more extensive treatment of the subject, he always implies that some trace of the former states has been preserved. Most of the expressions he uses are metaphors. He speaks of those traces as ' dormant pictures,'[2] ' stamps settled in the mind,'[3] ' ideas laid up in store,'[4] ' printed ' in the mind, ' roused and tumbled out of their dark cells into open daylight.'[6] " Our minds represent to us those tombs to which we are approaching, where, though the brass and marble remain, yet the inscriptions are effaced by time and the imagery moulders away."[7]

These and other similar comparisons show clearly that Locke tried to account for the exercise of the ' power ' and ' ability ' which belongs to the mind. Other passages suggest even more strongly that something is needed besides the mental faculty. When we forget ' ideas in the mind quickly fade, and often

[1] *Essay Concerning Human Understanding,* B. II., ch. X., §2.
[2] *Ibid.,* §7.
[3] §4.
[4] §8.
[6] §4, etc.
[6] §7.
[7] §5.

vanish quite out of the understanding, leaving no . . . footsteps or remaining characters of themselves,'[1] 'without the least glimpse remaining of them.'[2]

Whether such a complete disappearance ever occurs could be questioned (Leibniz insists that it is impossible, and modern psychologists hold the same view), but the point which is made clear is that Locke admits some 'footstep, glimpse, remaining character' of an idea which after its disappearance can be recalled to consciousness.

If nothing remained, how could Locke admit that sometimes the mind may be merely passive in the reproduction of ideas? This is implied when he asserts that, with regard to the revival of "the ideas that are lodged in the memory, the mind is oftentimes more than barely passive; the appearance of those dormant pictures depending sometimes on the will. The mind very often sets itself on work, in search of some hidden idea, and turns, as it were, the eye of the soul upon it; though sometimes, too, they start up in our minds of their own accord, and offer themselves to the understanding."[3] According to this statement our ideas may be voluntarily and intentionally recalled, and this explains the principle above quoted that to have an idea in the mind is to have the ability to revive it. But if ideas can 'start up in our minds *of their own accord* and offer themselves to the understanding,' the mind itself being *merely passive,* how can we say that nothing of them had remained? We have been told that memory is the power of the mind 'to paint ideas anew on itself'; must we say now that ideas which have totally disappeared paint themselves anew on the mind, and that ideas which are absolutely nothing now offer themselves to the mind?

Locke is not guilty of such contradictions. In our opinion, the first passage which we quoted from Locke was misinterpreted by Leibniz and by the historians of philosophy who have understood it as did Leibniz. They take it by itself and apart from the explanations which follow it. Against Locke, Leibniz

[1] §4.
[2] §5.
[3] §7.

asserts the persistence of some residua, dispositions of the mind or unconscious perceptions. These, however, were never rejected by Locke; if he does not admit unconscious perceptions, he certainly admits traces and vestiges of past perceptions. He simply asserts that the idea which is not present to consciousness is actually nowhere.

He goes further; although in the present chapter[1] he does not pass any judgment on the Cartesian theory, namely, 'how much the constitution of our bodies and the make of our animal spirits are concerned in this,' yet in another place,[2] he admits the theory as more probable. "Habits of thinking in the understanding, as well as of determining in the will, and of motions in the body . . . seem to be but trains of motions in the animal spirits, which, once set agoing, continue in the same steps they have been used to, which, by often treading, are worn into a smooth path, and the motion in it becomes easy."[3]

If we are not justified in concluding that Locke certainly admitted a physiological explanation of memory and mental habit, still less should we be justified in attributing to him the other childish theory, which explains memory by a mere word, reduces it to a faculty without any object on which it can exercise its activity, and without anything to connect the past with the present conscious state. It was really too easy for Leibniz to show the weakness of this supposed theory, and he cannot claim much merit for having refuted and ridiculed it.

Malebranche.

Malebranche's doctrine of memory and habit is for the most part the same as that of Descartes, with the difference, however, that as no creatures can be true causes, so there is no action of the body upon the soul, or of the soul upon the body. Memory is explained by traces left in the brain. "To explain memory, it is sufficient to understand this truth that all our perceptions are linked with changes that take place in the fibers, in that part

[1] §5.

[2] B. II., ch. XXXIII., §6.

[3] The question considered in this passage is not memory, but habit, both organic and mental, so that probably it applies also to memory.

of the brain where the soul is particularly located; if we suppose such a principle, we at once explain memory (parce que, ce seul principe supposé, la nature de la mémoire est expliquée)."[1]

"As soon as the soul acquires new ideas, new traces are impressed upon the brain, and as soon as the object produces new traces, the soul perceives new ideas." But this must be explained on the general theory of occasionalism. The soul has no knowledge whatever of the existence of the brain-vestiges; nor do these vestiges contain the ideas, with which they have no relation; nor finally does the soul receive its ideas from organic impressions, since it is not conceivable that the spirit receives anything from the body. When therefore the soul wants to move the arm, the arm is moved, although the soul does not even know what is necessary for that motion. In the same way when the animal spirits are disturbed and agitated, the soul feels an emotion, and yet it is not even aware of the existence of the animal spirits in the body.[2]

We cannot present here the interesting views of Malebranche on the connection or correlation (*liaison*) of the traces in the brain with the ideas in the mind, or of the traces among themselves.[3] We must note that the main cause why traces (and consequently corresponding ideas) are associated together, is that they have been impressed upon the brain at the same time. (This is still to-day one of the laws of association.) "The animal spirits, finding the path of all simultaneously produced traces open, proceed along them, because they can pass there more easily than in other parts of the brain; this is the cause of memory and of bodily habits."[4] The vividness of the images depends on the distinctness and on the size of the traces in the brain,[5] and therefore also on the qualities of the brain which are different at different ages of life.[6]

With regard to the nature of those traces, Malebranche says

[1] *De la recherche de la verité,* L. II., P. I., ch. V., §III.
[2] *Loc. cit.,* §I.
[3] Cf. *loc. cit.,* §I. and §II.
[4] *Loc. cit.,* §II.
[5] *Op. cit.,* L. II., P. I., ch. I., §III.
[6] *Loc. cit.,* ch. VI.

that they consist in the facility which the brain fibers retain of receiving again the same modifications that have been formerly impressed by the course of the animal spirits, as the branches of a tree, when they have been for some time bent in a certain way, take the same shape again more easily. Further explanations Malebranche declines to give, and alleges the reason—which seems to be an undisguised avowal of his inability to do so—that ' it is better for each one to explain it to himself by some mental effort; because the things which one finds in that manner are always more agreeable and strike us more vividly than those which we learn from others.'

Finally, in the same chapter,[2] Malebranche gives his theory of habits, which, as we have noticed above, is essentially the same as his theory of memory. The spirits do not always find the paths which they have to go through wide open and free from obstruction; hence one may experience some difficulty in moving one's fingers to play some musical instrument, or the muscles which are used in pronouncing foreign words. But little by little, by repeatedly passing through the same paths, the spirits open them and lessen the resistance. In consequence, ' it is clear that in some manner memory can be said to be a kind of habit,' so that ' if there were no perception correlated to the course of the animal spirits and to those traces, there would be no difference between memory and the other habits.' [3]

Condillac.

Condillac insists on Locke's principle that ideas, being modifications of the soul, cease to exist as soon as they cease to modify the soul, *i. e.*, as soon as they are out of consciousness. [4] " I have frequently heard questions like the following: What becomes of the ideas with which the mind is no longer occupied? Where are they preserved? Wherefrom do they come when they are represented to us anew? During these long intervals

[1] *Loc. cit.*, ch. V., §III.

[2] §IV.

[3] There are also spiritual habits which Malebranche admits for religious motives. Cf. *e. g.*, *Morale*, P. I., ch. II., III., VIII., etc.

[4] *Logique*, P. I., ch. IX.

of time when we do not think of them, where do they exist? In the soul? In the body?" But such questions and the answers which they sometimes receive from metaphysicians have no reasonable meaning. One must not imagine that ideas are like things which we keep in store, and that memory is an immense warehouse. It would be just as reasonable to inquire about the various successive shapes of some material substance and ask, "where is the sphericity of this body when it assumes another shape? Where is it preserved? And when the body becomes round again wherefrom does this shape come back to it?" Ideas are like sensations, states (manières d'être) of the soul; 'they exist as long as they modify the soul, and exist no longer as soon as they cease to modify it.' And indeed where would they be? In the mind? They have disappeared from consciousness and from the mind. In the body? They have never been there. Where are they? Nowhere; but they will reappear as soon as the movement with which they are correlated is reproduced. The case of the ideas which are out of consciousness is similar to that of a piano or a harpsichord which has stopped sounding. Where are its sounds? Nowhere certainly; but let the fingers strike the same keys, and the same sound will be reproduced. This comparison of the harpsichord is kept up all through this ninth chapter to explain sensation and memory.

The causes of retention and reproduction of ideas are the traces left in the organism, especially in the brain. "The multitude of our ideas supposes in the brain such a large number and variety of movements that it is not always possible for them to be reproduced with the same ease and exactness."

In another place,[1] sensation is said to occur 'when a movement takes place in one of the organs and is transmitted to the brain'; illusion, 'when the movement begins in the brain and is propagated to the sense organ'; and finally, memory, 'when the movement begins and ends in the brain . . . and because the movement which is the physical and occasional cause of it, is reproduced in the brain.'

These traces are represented as habits and 'facilities of cer-

[1] *Traité des sensations,* P. I., ch. II., 38.

tain parts of the brain for moving themselves '—' On a des idées dans la mémoire comme on a dans les doigts des pièces de clavecin.' But they exist also in other parts of the body, for they must be found wherever we find the ' occasional causes ' of the ideas which we remember, and thus *e. g.*, ' the memory of a tune which one plays has its seat in the fingers, in the ears and in the brain.' In what those traces consist we do not know. Some have conceived the nerves as strings under tension, capable of vibrating; but this is pure imagination. Nor can the Cartesian theory suffice. " They have failed to notice that if the brain-substance is soft enough to receive traces, it will not be firm enough to retain them. And they have not considered how impossible it is for an infinite number of traces to persist in a substance in which there is an uninterrupted action and circulation." We have to acknowledge the fact that habits are left in the brain, without being able to explain it. We cannot even understand how our sensations of sound and light are produced, since, to that effect, it would be necessary to know the essence of the soul, the mechanism of the eye, of the ear, of the brain, the nature of the rays which strike the retina, and of the air which strikes the drum of the ear. How then can we account for memory? How can we hope to explain habits in the brain, when we cannot even explain the habits of our fingers? " We must be satisfied with knowing that the same mechanism, whatever it may be, causes, preserves and reproduces the ideas."[1]

We cannot here show the development of cerebral traces. As the brain became better known, the nature of the impressions which it receives and preserves, was described more accurately. In the eighteenth century Hartley and Bonnet especially contributed to the rapid growth of physiological science. Nor shall we speak of the materialistic theories of the French philosophers, authors of the *Encyclopédie*. They explain not only memory, but also the whole psychical life as a mere product of the organism.[2]

[1] *Logique, l. cit.*

[2] An account of them can be found, *e. g.*, in Burnham, ' On Memory,' *Amer. Journal of Psychol.*, 1889, p. 72 ff. Also J. Soury, *Le système nerveux central*, Paris, 1899.

Summary.

Summing up now in a few points the results of our investigation, we can reduce the theories proposed in the past to explain retention and reproduction, to the following:

1. Some philosophers seem to have been discouraged by the difficulty. After stating the facts, they declare that an explanation is impossible. Memory is a native faculty of the mind, and no reason for it can be given.

2. When an attempt is made towards an explanation, we frequently are offered metaphors instead of a theory. It seems as though the writers could not express their thought otherwise than by figures and comparisons.

3. A more positive and more direct answer is for the most part expressed in terms of metaphysics. This was, it is true, the tendency of the age, but it cannot be doubted that the absence of more concrete notions and laws is also responsible for the use of this language.

4. We find also a physiological theory, which offers something easily understood, but it is on the whole very vague, not only as an explanation of psychical facts, but even in its physiological aspect; hence the frequent use of metaphors.

Let us now turn to recent theories and see whether some more satisfactory hypothesis will be found, whether anything new has been devised, or whether the ancient philosophers knew all that it is possible to know on the present question.

CHAPTER III. Modern Theories.

Introductory.

Division of Chapter.

When we try to solve the problems of memory, imagination, association and habit, the fundamental question that confronts us is this: What is that 'something' which remains after an action has been performed, and enables it to exercise an influence over subsequent actions? In our physical, physiological, sensitive, intellectual, moral life, our actions do not stand by themselves as independent units; each of them is conditioned by those that have preceded it. A process that takes place to-day will be repeated more easily to-morrow; an idea which comes to consciousness and soon disappears may come back after days, weeks, years of absence from consciousness. What is the permanent link which unites two transitory actions or states of mind?

As we have noticed already, the question of interest to us now is not that of merely organic habit, but that of the revival and facilitation of conscious processes. Our ideas are preserved, not indeed as though they were laid by and stored up as the miser's treasure, but rather 'as a circulating capital, which now appears, now disappears, but never ceases to be of use.'[1] In the interval which elapses between the occurrence and the return of an idea to consciousness, when, although unconscious, it nevertheless exercises some activity, determines, influences, modifies new processes, what has become of the idea itself? It, or at least something of it remains; but what is the nature of that inalienable capital?

Several answers are suggested. (1) The idea itself may be preserved, but only in a subconscious state, ready however to make its reappearance in consciousness under favorable circum-

[1] E. Chartier, 'Sur la mémoire,' *Revue de métaphysique et de morale,* VII., 1899, p. 302.

stances. (2) To this view is commonly opposed what has been called the theory of traces or dispositions, according to which an idea, once it has left consciousness, ceases completely to exist as an idea, but leaves some persistent effect, a trace, a disposition, which makes its return possible. This theory again is proposed in different ways. (*a*) The idea may leave in the mind itself a permanent modification of a purely mental character. (*b*) As all conscious process is accompanied by an organic process, we may conceive of the connecting link between two ideas as being partly physiological and partly psychical. (*c*) Finally we may attribute memory to the organism alone, and explain it by merely physiological traces. Organic traces themselves, in this last and in the preceding theory, may be explained as persistent movements, fixed impressions, or permanent dispositions. These are the different views which we have now to present.

Theory of Subconsciousness.

The theory of the persistence of the ideas in subconsciousness is advocated by J. Ward.[1] There are three degrees of mental states: (1) A center or focus of consciousness; (2) a wider field, any part of which may at once become the focus; (3) subconsciousness, in which ' presentations have not the power to divert attention, nor can we voluntarily concentrate attention upon them ' before they cross the threshold of consciousness. This threshold of consciousness ' must be compared to the surface of a lake, and subconsciousness to the depths beneath it, and all the current terminology of presentations rising and sinking implies this or some similar figure. [2] We have seen that St. Augustine uses many comparisons and metaphors similar to this when he speaks of the knowledge preserved in the hidden recesses of the mind, till it comes to the front and places itself in greater evidence before the soul.[3]

[1] Art. 'Psychology' in *Encyclopedia Britannica.*

[2] P. 47.

[3] "Admonemur esse nobis in abdito mentis quarumdam rerum quasdam notitias, et tunc quodammodo procedere in medium, atque in conspectu mentis velut apertius constitui quando cogitantur." *De Trinitate,* L. XIV., c. VII.

Subconscious presentations are too weak; they lack the intensity necessary to change the distribution of attention in an appreciable degree and to make them definite features. Yet 'they may tell on conscious life as sunshine or mist tells on a landscape, or the underlying writing on a palimpsest.'[1] It is not assumed, however, that all presentations are imperishable; hence we must admit a distinction between obliviscence, from which an idea may spring again to consciousness, and complete oblivion into which many ideas lapse, and from which there is no recall. Memory therefore is simply the moving forward of presentations which had been kept in the background or below the threshold; it is the emerging to the surface of ideas which had sunk into the depths of the lake of consciousness.

Similar views are held by A. Fouillée,[2] who applies to the theory of functional dispositions, the same criticism as Ward. All structural dispositions of molecules in the nervous elements are 'constant systems of motion'; and on the mental side also there is constant activity, unbroken exercise of functions. But these functions may be exercised in consciousness without sufficient intensity to become distinct. "We are thus brought back to the hypothesis of an infinite number of degrees of consciousness, which, when they are too weak, are only subconscious. They produce a result in consciousness taken as a whole, and are its elements separately indiscriminated."

This is the same theory which, at least in its essential features, had been upheld by Herbart, and before him by Leibniz in his famous distinction between perception and apperception. Hence we might say with a French writer whom we have already quoted,[3] that we can think of some object without being aware of it; for "if we are justified in affirming that the architect does not always actually build, as, for instance, when he is lying in bed and asleep, or when he is eating, we cannot say that the geometrician is not actually a geometrician (n'est pas géomètre en acte) even when he is sleeping or eating; for

[1] P. 48.

[2] *L'Evolutionnisme des idées-forces*, p. 65.

[3] E. Chartier, 'Sur la mémoire,' *Revue de métaphysique et de morale*, VII., p. 30.

thought does not necessarily manifest itself by visible and tangible actions, as is the case with the act of building. And as it is possible that the architect may build without thinking of it, if he happens to move his compasses whilst thinking of something else, so it is possible for the geometrician to be actually a geometrician without thinking of it, or more exactly, without being aware that he is thinking of it." Galileo, after his discovery, was at all times the man who held that the earth revolved around the sun. When the trend of his ideas did not "make him aware that he was thinking of it, he was thinking of it in the same manner as he breathed or walked, or as the sailor keeps his balance on his legs (tant qu'il n' était pas amené par d'autres pensées qui impliquaient visiblement celle-là, à penser qu'il y pensait, il y pensait comme il respirait, comme il marchait, et comme le marin se balance sur ses jambes)." There is in us a current of actual thought, subconscious, constantly present, constantly active; there is an actual, yet unconscious, or unthought of, thought.

Theory of Dispositions in General.

Reasons for the Existence of Dispositions.

Most psychologists reject the preceding theory, according to which, ideas would be stored up in the mind, and would lie dormant below the threshold of consciousness. "If the image has left consciousness, it has left the mind, as far as we know."[1] An unconscious idea or presentation seems to be a contradiction, since the only way according to which we can take cognizance of a presentation is through the consciousness of it. That an idea may be preserved without clear and distinct consciousness, not in the focus, but still within the field of consciousness, all admit. But as soon as it disappears below the surface, as soon as it is no longer visible, then we have no right to call it an idea or a presentation. It is a trace, a disposition, which makes it possible to reproduce the idea. Breathing, walking, are unconscious actions, but we can, if we choose, become aware of them. The geometrician, on the contrary, if he reflects on himself,

[1] Baldwin, *Handbook of Psychology*, I., 153.

will frequently find that he is not thinking at all about geometry. So also it is true that Galileo was at all times the same man who had affirmed on many occasions and was ready to affirm again the earth's motion; but must we say that he was always thinking of it, in the same manner as he was always breathing? The true statement is that he was in the 'disposition' to think of it, but so far as we know, had no actual thought of it. "To have an idea in memory means that from former presentations we have acquired the disposition to revive similar presentations in imagination (durch vorausgegangene Vorstellungen A_1 A_1' A_1'' . . . die Fähigkeit oder Disposition DA erworben haben, inhaltsähnliche Phantasievorstellungen A_2 A_2' A_2'' zu erleben)."[1] We cannot conceive of an idea sinking into subconsciousness as we think of a stone sinking below the surface of the water in a lake; the idea is a process, a function, not a substance. Even if we admit that a disposition can be only 'a fainter discharge of function' (Ward), when the function, whether on the mental or on the organic side, is discharged too faintly to arouse consciousness by drawing the attention to itself, too faintly even to be capable of being perceived under the influence of voluntary attention, then it no longer deserves the name of idea or presentation. It is a trace, a disposition, a link between two ideas, of which one has entirely disappeared as idea and the other has not yet appeared. To call it presentation has no plausible meaning.[2]

We come therefore to a more common view which has justly been called the theory of 'dispositions.' In order to have a clearer understanding of it, let us first consider what the word disposition itself signifies.

The Word 'Disposition.'

The word disposition has more than one meaning; etymologically it signifies a placing apart, asunder (dis-positio, Greek διάθεσις), and conveys the idea of a distribution of the parts of a whole, or of an arrangement and order of material things.

[1] Höfler, *Psychologie*, 165.

[2] Lipps, *Grundthatsachen des Seelenlebens*, p. 77. Cf. Stout, *Analytic Psychology*, Vol. I., p. 24 ff.

Aristotle defines it 'the arrangement of that which has parts either according to place, or according to power, or according to form and species.'[1]

In this sense disposition supposes plurality and implies a classification or arrangement of several things according to some norm or principle, and frequently also for a given purpose. We speak of the disposition of books on a shelf according to their size, binding, subject-matter, etc. Thus also we speak of the disposition of trees in an orchard, of the various parts of an army, of the houses in a city. In that sense St. Augustine makes disposition the principle of order: 'Ordo est parium dispariumque rerum sua cuique loca tribuens dispositio.'[2]

In a slightly different sense, disposition becomes a synonym of distribution, destination, or definite settlement. Thus we say that one has made the disposition of his goods, of his property; that he has disposed of them in favor of such or such a person, meaning that he has himself given them over, or, at least, that he has manifested his will to have them disposed of in that manner. The idea of will becomes more prominent when the word disposition is used to express a law, a command, and especially a divine dispensation and order.

The natural tendency, fitness and aptitude which results from the very constitution and essence of a thing, and from a certain arrangement of its parts, or which is itself the principle of a certain arrangement and distribution of parts, or the source of activity, is also called a disposition. We can say with Newton that 'refrangibility of the rays of light is their disposition to be refracted or turned out of their way, in passing out of one transparent body or medium into another.' We can speak of the disposition of plants to grow upward, etc. Applied to man, disposition frequently means the natural condition of his body, such as health and disease; but especially his mental and moral aptitudes, either in general, as temper, character, abilities, or in a more restricted sense, as the present humor, caprice, fancy. Thus we speak of an amiable, irritable, happy, melancholy . . . disposition. We say that a man has a disposition to undertake

[1] *Metaphys.*, IV., 19, 1022b, 1.

[2] *De civitate Dei*, XIX., 13.

a special work, to make progress in a special branch of knowledge, to enter this or that line of business; that he is of a friendly disposition towards his fellowmen or towards a special individual. We mean by this a special arrangement of the faculties and tendencies, a special combination of what we conceive as being the elements which make up the mind, or the moral and social man. This signification is found not unfrequently in Greek philosophers for the word διάθεσις.

It must also be noted that the Greek form itself is used in modern languages, but with a more restricted meaning. Applied to the body, it signifies a special condition which predisposes to a certain disease, and especially an hereditary or innate condition, which remains latent for some time, and then manifests itself by some pathological affection. One may have a consumptive, a gouty diathesis. Applied to the mind, it is restricted mostly to degeneration, and to the liability, under special circumstances, to become insane.

From what precedes, we see that the word disposition is taken sometimes in a passive sense to express an actual state, an arrangement of parts; sometimes also, as referring more especially to an activity which is yet potential, but tends to produce a given result, to reach a determined end. From the primitive signification of order and distribution has been derived the signification of a special tendency and activity, till finally the original meaning is sometimes lost sight of, and disposition becomes simply aptitude, tendency or habit.

Use of the Word Disposition in Psychology.

When we explain the revival of past conscious states by the theory of dispositions, it is meant that some modification has been produced, that some new state has been brought about in the mind itself, or in the organism, whose processes are the conditions of mental processes. But it is also meant that this actual condition tends to a definite end, the reproduction of the past state. It is something potential, and we conceive it as a factor concurring in the production of subsequent processes; and the more we repeat a certain process, the deeper the modification becomes; hence the stronger the tendency and habit.

This is the reason why other words sometimes used have been criticized and rejected as insufficient. We frequently speak of traces, residua, vestiges; but a trace (Spur), says Lipps,[1] has nothing to do with the reproduction of the process of which it is a trace. On the contrary, the word disposition indicates what we must admit here, namely the tendency to reproduce a past state.

Wundt distinguishes the trace or "Spur" from the disposition, because the disposition not only facilitates the production of certain processes, but is itself of a nature akin to the process that is to be reproduced.[2] The eye which has seen an object in an intense light preserves an after-image as a result of the impression, and this is a 'Spur'; the eye which frequently compares and measures distances acquires a greater and more accurate power of judging spatial relations, and this is a 'Disposition.'

The terms trace, residuum, 'carry a structural connotation, an actual marking or path-making being supposed in the brain. The theory of the Disposition is coming to give a more functional interpretation to the facts, and that term is displacing these.'[3] In revival due to association, there must be something for the actual perception to act on, 'an appropriate *trace* of past experience constituting a preparatory *disposition* for future experience.'[4]

In the following pages the word disposition will be used more frequently, yet other terms already mentioned may also be used in the same sense.

(*a*) Psychical Theories.

Some writers propose an explanation of the facts of memory and mental habit, which is almost exclusively psychological.

[1] *Grundthatsachen des Seelenlebens,* 77.

[2] "Die 'Spur' wird von der blossen functionellen 'Disposition' als eine Art der Nachwirkung unterschieden, die nicht nur die Entstehung gewisser Vorgänge erleichtert, sondern selbst einen bleibenden, noch dazu mit dem zu erneuernden Vorgang verwandten Zustand darstellt." *Grundzüge zu der Physiologischen Psychologie,* III., 565.

[3] Baldwin and Stout, in *Diction. of Philos. and Psychol.,* s. v. Trace.

[4] Stout, *Manual of Psychology,* 83.

Not indeed that they deny the existence of organic processes accompanying mental processes, nor that they reject the existence of organic dispositions left by these processes, but the mental series seems to be sufficient in itself, and once given a conscious process it can be reproduced by the mind's own power. The first writer of this class whom we have to consider is Lotze.

The ' unworthy ' surrendering of the spiritual to the changes in the material substratum would have for its consequence the incoherence of the mental life. Hence Lotze does not hesitate to assert that ' the mind itself has the power to preserve acquired impressions independently of the permanence of their physical conditions, and to connect them together according to laws which need not have anything in common with the modes of action of nerve-forces.' Indeed the opposite view, even if it is possible and tenable, must be rejected, because the present view is ' more in harmony with our mental needs.' We can think of memory, of association, of the course of imagination, as being explained ' without the coöperation of the central organ.' We can suppose that the activity of the brain may cease, and yet memory remain uninterrupted. Even if it is no longer possible to receive external impressions, we have no reason to assert that it will be a hindrance to the unlimited permanence of those already acquired.[1]

However, it is not meant that representations are absolutely independent of the brain, for there is an interaction between mind and body. Although memory could be accounted for by the mind's power alone, yet the brain processes contribute to make the representations brighter, clearer and more distinct. But those accessory (or simultaneous) oscillations (Mitoscillationen) of the central organ, which accompany the psychical train of representations, are not its cause, but rather its conse-

[1] " Wir legen . . . die Annahme zu Grunde . . . dass in dem Augenblicke in welchem man den Einfluss der letzteren (der Centralorgane) unterbrochen dächte, kein Grund für die Unterbrechung, kein Hinderniss für die unbeschränkte Fortdauer des Erinnerungslaufes eintreten würde, obgleich die Empfänglichkeit für alle aüssern Eindrücke verloren wäre." *Medicinische Psychologie,* §36, No. 399.

quence. "It is a kind of resonance which the activity of the mind calls forth in the material substratum, in order to add to the vividness of its representations" (No. 401).

Furthermore the theory of physiological traces is possible, but 'unlikely,' and 'leads to inextricable difficulties' (No. 411). Although there is an influence of cerebral changes on the train of thought, 'the assumption of a special organ of memory, even if it is conceived simply as a means of support for the soul's own power of remembrance, is exposed to greater difficulties than is commonly believed.' The objection taken from the unceasing change and renovation of the brain elements has not yet been satisfactorily answered.[1] Moreover if we admit that an atom of the brain can preserve countless impressions without confusion, why should the soul, a simple being also, be denied the same power?

As to pathological cases in which loss of memory corresponds to a certain disease or wound in a determined part of the brain, Lotze sums up his explanation as follows: Consciousness has no need of being linked with the function of an organ so strictly that it must cease or become abnormal, if the organ happens to be diseased. But there are impressions which can alter the inner condition of the mind, and these can stop or alter consciousness.[2]

Professor Bowne also rejects all physiological theories; not only recognition, but even retention and reproduction are inexplicable on physiological grounds. In fact, it is just as impossible to explain them on a psychical theory; for 'this power of reproduction and recognition has no analogue elsewhere. All attempts to tell how it is possible overlook the essential features of the fact, while the various faculties invented for its explanation are abstractions from the fact itself.' "How the mind can do this, we do not pretend to know. We have to be content

[1] *Mikrokosmus,* B. III., c. III., §5, p. 365.

[2] "Nicht das Bewusstsein braucht erzeugt zu werden durch ein Organ, mit dessen Beschädigung es verginge; aber es kann als eine eingeborene Fähigkeit der Seele von unzähligen Seiten her durch Eindrücke gehemmt werden, welche den inneren Zustand der Seele ungünstig verändern." *Mikrokosmus,* p. 370; cf. p. 368. *Medicinische Psychologie,* l. c., No. 411 ff.

with knowing that it does it, although we cannot construct the process."[1]

Remembering is a faculty of the mind alone; and although strictly speaking the brain can no more be called the organ of memory than the organ of thought, yet such an expression can be used, not indeed to mean 'that the brain does the remembering and thinking for the mind, or that the mind uses the brain to think or remember with, but only that thought and recollection are cerebrally conditioned.'[2]

Memory, as in Reid's theory, is an independent power of the mind, and in the mind itself; it must be conceived simply as the faculty to reproduce and recognize the past. Bowne seems to reject all theories of traces or dispositions. "Our possession of a knowledge of which we are not conscious means only that we can reproduce that knowledge upon occasion. In no other sense is past experience latent in us."[3] Yet it is difficult to stop at this point without admitting the persistence of something by which the general power and faculty of the mind is determined. Although the past 'is not carried in the mind at all,' still are we not obliged to say that it has worked a permanent effect, namely, the determination and specification of the faculty? Different states leave different modifications, and it is difficult to see how one who admits the mind's power to reproduce the past could forbear admitting mental traces of past conscious states.

Lipps[4] gives an extensive treatment of the theory of dispositions. In order that an idea *q* be able to recall to the mind an idea *p*, it is necessary that *p* should have been given once in the mind, and should have left there some after-effect. This after-effect must be conceived neither as a persistence of the presentation itself, nor as a trace or disposition left in the organism.[5] We have seen, however, that according to Lipps, the

[1] *Introduction to Psychological Theory*, p. 87.

[2] *Metaphysics*, p. 397.

[3] *Introduction to Psychological Theory*, p. 87.

[4] *Grundthatsachen des Seelenlebens;* cf. Sach-Register.

[5] "Wir können diese Nachwirkung als Spur der ehemaligen Vorstellung *p* bezeichnen, wenn wir dabei nicht an materielle Spuren denken, wozu wir psychologischer Weise kein Recht haben, und nicht en eine Fortexistenz der Vorstellung selbst, nur in unbewusstem, gehemmtem, gebundenem, überhaupt reducirtem Zustande, was im Grunde keinen Sinn gibt." *Op. cit.*, p. 77.

word 'Disposition' is to be preferred to the word 'Spur.' The psychical disposition is in itself of a nature 'completely unknown'; it is a 'mental state,' the existence of which we can know only through its effects.

Dispositions are not independent of, but they are contained in, one another, and they combine so as to produce a new result. Thus a disposition to *A* and a disposition to *C* may give also a disposition to *B*, which is contained partly in *A* and partly in *C*. If I have experienced a sensation of red and a sensation of yellow, both leave a disposition in the mind, and I can acquire a disposition to the color orange which is akin to both red and yellow, although perhaps I have never actually perceived that color.[1]

All our ideas are closely related, and these relations are (*a*) of quality (as harmonic sounds, symmetry); (*b*) of quantity (*e. g.*, if the intensity be increased, it makes the soul more attentive); (*c*) of order (in space and time); (*d*) of a more general character (as pleasure and pain). Of all relations between ideas, dispositions are left in the mind.[2]

Dispositions are but the faculties modified in such a way that they no longer need for the exercise of their activity any stimulation from external objects; an inner stimulus alone is sufficient. This inner stimulus is an idea which bears a relation of similitude or contrast to the former idea which it recalls.[3]

A disposition has a latent potential energy of its own which it gives forth when it is excited. If near a piece of hot metal *M* you bring a piece of cold metal *M'*, *M* will communicate a part of its heat to *M'*; but the total heat of $M + M'$ is not greater than the heat which formerly was in *M*; and *a fortiori* the heat in *M'* is not greater than that which was in *M*, because *M'* contributes nothing of its own to the actual sum of heat. If, on the contrary, you place near the red hot *M* an explosive or easily combustible substance *S*, *S* will receive some heat from *M*, but will give out far more than it has received; the amount will be increased, because *S* will at the same time release its own

[1] *Op. cit.*, pp. 77, 95, 96.
[2] *Op. cit.*, p. 85.
[3] Pp. 95, 104.

latent energy. Now, to use this imperfect comparison, we must say that the mental process of reproduction takes place in this last manner, and 'we can speak of the explosive character of reproduction.' A disposition has in itself a latent mental energy-of-representation which it gives out when stimulated by other representations. Hence a new reason to prefer the word 'Disposition' to the word 'Spur,' for 'disposition' implies that there is more than a mere transmission of energy. The disposition itself contributes somewhat to the final result.[1]

(*b*) Psychophysical Theories.

The close relation which exists between the functions of retention and reproduction in consciousness and brain processes has been recently the object of many fruitful investigations. Studies and experiments in physiology have shown how nerves once stimulated can keep for a long time permanent modifications produced by a former excitation. Cerebral localizations have been more accurately determined, especially with regard to memory, and the researches on the 'diseases of memory' have contributed largely to show the dependence of mental on physical retention. Hence the organic aspect of memory has been insisted upon.

But many psychologists, while fully recognizing the importance of physical factors and conditions, insist on their insufficiency, and on the importance of the mind's activity in memory. They either claim that, parallel to the physical series of changes and dispositions, we have to admit also changes and dispositions in the mind itself; or that at least the higher acts of conscious memory, especially recognition, must be explained on a psychological basis.

If we assume that there is a perfect, unbroken parallelism of the mental and of the organic series, and if memory has essentially a mental side, then we must say not only that to organic processes mental processes correspond, but also that to organic dispositions there are corresponding mental dispositions. We do not consider here retention in the organism, nor

[1] P. 107.

dispositions to certain movements, but retention which enables us to bring back to consciousness sights and sounds, feelings and emotions, etc. And so we may say that 'this higher mode of retentiveness supposes that something has been ingrained in the mental and nervous structure'; and we are justified in speaking of the 'plastic energy of the mind.'[1]

Ebbinghaus argues as follows:[2] If physical dispositions are necessary to explain the reappearance of certain processes in the physical series, how can we account for the reproduction of mental processes without psychical dispositions? Is not the causal nexus as necessary to account for mental phenomena as it is for physical effects? Does a mental action suddenly spring out of nothingness, and after some time return again into nothingness?[3] The dispositions are not, it is true, knowable directly in themselves, but they must necessarily be admitted as causes and effects of directly knowable conscious states. They are not similar to conscious presentations, 'but nevertheless must be acknowledged as something psychical.'

Höffding's position is similar.[4] "When we speak of traces, residua or dispositions, which remain after the sensations and presentations have vanished from consciousness, we assume that there must be on the mental side something analogous to the conservation of energy in the material world." These dispositions are unconscious, and therefore cannot be introspectively perceived by us.

Wundt[5] admits both in the nervous system and in the mind the existence of 'functional dispositions,' which enable us to revive past impressions. A disposition in the nervous system does not consist in the continuance of the function, but in the possibility and facilitation of its return. Psychical dispositions must be explained in the same manner; the only actual presen-

[1] Bain, *Senses and Intellect,* pp. 337, 468.

[2] *Grundzüge der Psychologie,* B. I., §5, p. 53 ff.

[3] "Derselbe Zwang, der aus den oben erörterten Thatsachen sicherlich zur Ansetzung nervöser Nachwirkungen, Dispositionen, u. dergl. führt, führt offenbar ebensogut, wenn Geistigkeit ein Begleitphänomen des Nervösen ist, zur Ansetzung geistiger Dispositionen, die eben das gesuchte Unbewusste bilden."

[4] *Psychologie,* p. 194.

[5] *Grundzüge der Physiol. Psychol.,* III., pp. 330, 331.

tations are the conscious presentations. Those that have disappeared from consciousness remain only as 'psychical dispositions of an unknown nature,' which are left for the revival of those functions. What they are in themselves we do not know; nor can we hope ever to know, since the limits of consciousness are at the same time the limits of our inner experience.

Stout devotes several pages of his *Analytic Psychology*[1] to the theory of psychical dispositions. In the present state of psychology there is at least a practical justification for positing 'unconscious or undiscriminated mental factors for the explanation of conscious process' (20). Against Ward he states that when a process is reproduced, 'the preëxisting fainter activity can only be regarded as a physiological disposition correlated with a psychical disposition, and not as an actual functional activity correlated with an actual presentation' (26). And we cannot adhere strictly to physiological language, when we consider the reproduction of conscious processes, we cannot refer to a physiological disposition 'without at the same time referring to it as a psychical disposition.' Hence the conclusion that when we want to separate unambiguously the purely psychological evidence concerning the interconnection and mode of operation of residual traces from corresponding physiological data and hypotheses, it is best to use the term 'psychical disposition.' If, on the contrary, we desire to consider exclusively the physiological side, the term 'physiological disposition' is in place. And finally, if both are taken into account, it is appropriate to speak of 'psycho-physical dispositions.'

We have already quoted Fouillée as advocating the theory of subconscious ideas in his *Evolutionnisme des Idées-forces*. Elsewhere, however, he speaks also of traces and residua.[2] The retention of ideas is essentially and indivisibly psychological and physiological; it is not merely an organic process with an accidental addition of consciousness. A thing deprived of cognitive powers can indeed preserve motions, impressions, traces, but this is an altogether external preservation, and not

[1] Pp. 21–26 and *passim*.

[2] 'Le mécanisme de la mémoire,' *Revue des deux mondes*, 15 Mai, 1885, p. 367, 368, 369 ff.

that retention at once mechanical and mental in which memory consists.[1] Even interpreting these statements as referring to a persistence of function in the organism and of the idea in subconsciousness, we see that the author teaches that memory requires something which is left not only in the organism but also in the mind itself.

Other thinkers take a somewhat different view; for them also both the organism and the mind concur in the production of the complete phenomenon of memory, but not in a parallel manner. In the first stages of memory, *i. e.,* retention, association, reproduction, they lay the main stress on the physical traces left in the brain, although they may not overlook entirely the mental side. But memory is essentially conscious. It also essentially includes the recognition of an idea and the reference of it to the past. For the explanation of these last facts, physical dispositions become manifestly insufficient, and memory must be attributed to the mind.

Thus Professor James[2] writes that 'the cause both of retention and recollection is the law of habit in the nervous system, working as it does in the association of ideas.' And again: "The machinery of recall is the same as the machinery of association, and the machinery of association, as we know, is nothing but the elementary law of habit in the nervous centers" (654). So that memory is 'altogether conditioned on brain-paths; its excellence in a given individual will depend partly on the number and partly on the persistence of these paths' (659). But although 'retention is no mysterious storing up of an idea'; although 'it is not a fact of the mental order at all,' but 'a purely physical phenomenon, a morphological feature,' nevertheless "the recall or recollection . . . is a *psycho-*

[1] "L'être qui ne sent pas peut sans doute conserver tantôt des mouvemens, comme l'eau qui ondule, tantôt des empreintes ou résidus, comme le sable du rivage; mais ce mode de conservation tout extérieur n'est pas cette conservation indivisiblement mécanique et mentale sans laquelle on ne peut parler de souvenir proprement dit. . . . La conservation des souvenirs n'est pas pour nous, comme pour MM. Ribot et Maudsley, un phénomène physiologique qui n'aurait qu'accidentellement un reflet psychologique; elle est un phenomène indivisiblement psychologique et physiologique" (370).

[2] *Principles of Psychology,* I., 653.

physical phenomenon with both a bodily and a mental side. The bodily side is the functional excitement of the tracts and paths in question; the mental side is the conscious vision of the past occurrence, and the belief that we have experienced it before" (655).

Professor Ladd describes at length the physical conditions of memory 'which are to be found in certain biological laws, as well as also in specific qualities of the nervous substance of the cerebral centers.'[1] He holds that "properly speaking, the retention of states of consciousness, whether of ideas or of presentations of sense is not a faculty or power of the mind. . . . It is only in the facts and laws of conscious reproduction that any trace of the activity of the mind, as memory, can be found. . . . Of unconscious retention and reproduction of ideas as an activity of mind, there is none."[2] The physical basis of these is to be found in the modifications produced in the nervous elements, especially in the nerve-cells. But "none of these physical conditions immediately concerns the very mental activity which constitutes the essence of *conscious* memory. What is explained, if anything, is simply why I remember one thing rather than another, *granted the mind's power to remember at all.* This power is a spiritual faculty, wholly *sui generis*"; and memory is 'a mysterious *actus* of the mind connecting its present and its past' (§23).

In his *Handbook of Psychology,*[3] Professor Baldwin reviews the different theories of retention and reproduction. He rejects as false, or at least as psychologically unfounded, the theories which explain retention by a storing away of ideas in the mind, by a psychological habit or disposition, by subconsciousness. He maintains the 'physiological theory of retention' (p. 157). But assuming the fact of retention 'it is easy to see that this purely physical modification does not account for the revival of an image in consciousness. The essential element of memory is lacking' (p. 164).

[1] *Psychology, Descriptive and Explanatory,* P. II., ch. XII., p. 241. Cf. *Elements of Physiological Psychology,* P. II., ch. X.

[2] *Elements of Physiological Psychology., l. c.,* §14.

[3] *Senses and Intellect,* ch. IX., X.

Rehmke rejects all psychical traces, residua, dispositions, because they would be something mental and yet unconscious. He explains retention by changes and modifications in the brain; but recognition, which is an essential part of memory, is not based on physiological traces; it is purely psychical.[1]

"There is no physiological theory of memory, writes E. Goblot,[2] but a physiological theory of association." Indeed 'most psychologists to-day admit that the preservation of our knowledge is a physiological property of the brain cortex' (489). After the disappearance of the conscious fact, nothing remains but a purely organic modification of the cortical substance, so that 'association really exists only between the organic actions which correspond to ideas' (490). On the contrary, memory cannot be explained by any cerebral automatism; it cannot be reduced to a mechanical action, because 'it is judgment, discernment, perceived relation' (492).

Bergson's theory of memory includes, as the title itself of his book indicates (Matière et mémoire. Essai sur la relation du corps à l'esprit), a general view of mental life, and of the relations of mind and body. It is in many respects a departure from the views commonly held by psychologists. The work, both on account of the criticism of some of these views and of the new constructive aspects which it presents, is worthy of the most serious consideration. For this reason, we shall devote a few pages to its analysis.

The theory held by Bergson is essentially dualistic. Mind and body are two distinct realities; their respective functions are of different nature. But they are united; they help and complete each other; and for this reason we mention the theory here since the organism and the mind concur in the explanation of memory and habit.

The body is and can be nothing but an instrument for action, *i. e.*, movement. This applies also to the nervous system; the brain has no function essentially different from the functions of the spinal cord. It is neither a cause nor a direct con-

[1] *Lehrbuch der allgemeinen Psychologie*, 255, 512.

[2] 'Théorie physiologique de l'association,' *Revue philosophique*, Vol. 46, 1898, p. 493.

dition of conscious processes. It analyzes the received movement and selects the movement of reaction. "But in both cases its *rôle* is exclusively to transmit and divide movement." It is like the central office of a telephone. Hence the complexity of the brain is the source of the diversity of the movements of reaction (pp. 16, 17).

Perception cannot belong to the body, since it cannot be reduced to movement; and materialism cannot be accepted. Still the nature of perception is to be practical, to be entirely 'turned towards action, not towards pure knowledge.' The source of many psychological confusions and errors is precisely in making it purely representative. Perception is the representation of our possible actions on things; it appears at the precise time when a movement received in matter does not issue in a necessary reaction. Where the reaction follows necessarily there is no consciousness; where the movement of reaction is arrested perception takes place (17, 18). Perception comes from a 'kind of question directed to our motor activity.' It is a practical choice: "Percevoir consciemment signifie choisir, et la conscience consiste avant tout dans ce discernement pratique" (35, 39).

Memory is of two kinds, which it is important to distinguish. One has *all* the characters of a habit. It is acquired by repetition, including decomposition and recomposition; it is stored up in mechanisms of the body which it has organized, and the movements of which have become automatic. It 'plays' the past without representing it. Such is the case with a lesson learned by repeating it several times.[1] This memory does not refer to the past, except in so far as it *actually* preserves the 'intelligently coördinated movements which represent its accumulated efforts' (79). To this retention corresponds a recognition 'dans l'instantané,' of which the body alone is capable. Thus if a man is not acquainted with a city, he hesitates; sev-

[1] "La leçon une fois apprise ne porte aucune marque sur elle qui trahisse ses origines et la classe dans le passé; elle fait partie de mon présent au même titre que mon habitude de marcher ou d'écrire; elle est vécue, elle est 'agie,' plutôt qu'elle n'est representée;—je pourrais la croire innée s'il ne me plaisait d'évoquer en même temps, comme autant de représentations, les lectures successives qui m'ont servi à l'apprendre" (77).

eral alternatives offer themselves to his movement. When he becomes acquainted with it, he walks automatically, machine-like, without a distinct perception of the objects before which he passes (93).

The second kind of memory, on the contrary, has *none* of the characters of habit (76) *e. g.,* the memory of one of the readings by which I have learnt my lesson. It is an individual past event; its very essence is to bear its own date, and therefore it is impossible to repeat it. This memory, if it was acting apart from the influences of the other, would register in the form of mental images, all the events of our life, with their respective places and dates, all their details and circumstances, without any practical end, but as mere representations (68, 164). This is the 'true' memory, coextensive with consciousness.

Whereas memory-habit is organic, memory proper is spiritual. To say that images are preserved in the brain—exclusively an instrument of movement—is meaningless (161). Memory is 'absolutely independent of matter' (194); it is a 'spiritual manifestation' (269).

How then shall we explain the fact that the brain plays an important part, even in memory? How shall we account for cerebral localization? Action and consciousness, present and past, organic habit and mental memory, organic recognition by familiarity and conscious recognition, are not sets of independent processes, but the members of each pair help and complete each other. The concrete present, as we know and experience it, is not a mathematical point, but has a duration. It is essentially sensori-motor, being a perception of what has just passed, and a determination of the immediate future (148, 149). The immediate past is sensation; for a sensation supposes a multitude of stimulations, distinct and successive in nature, but collected together in consciousness (*e. g.,* ether vibrations for vision; air vibrations for hearing). So that all perception supposes memory. "*Nous ne percevons, pratiquement, que le passé,* le présent pur étant l'insaisissable progrès du passé rongeant l'avenir" (163).

Memory proper consists 'not in a regression from the present to the past, but on the contrary in a progress from the past to the present' (268, cf. 164 ff.). Our mental life can be compared to a pyramid, the apex of which represents the present, and is in contact with a plane representing action. The mind can place itself at different sections of this pyramid, and according as it places itself farther from the apex, it enters its past with its details. At one extremity we should 'dream' our own existence and exercise only our memory. At the other extremity, remaining in the present (action), we should 'play' our past existence, instead of representing it to ourselves. In normal life, we place ourselves between these two extremes, sometimes nearer to action, and sometimes nearer to reverie. In abnormal cases the mind is at one of the extremes (164–169).

Thus organic (habit) and mental memory complete each other. Cerebral mechanisms are the terminus of the series of past representations, their link (point d'attache) with the real, *i. e.*, with action. If this union be severed, the image is perhaps not destroyed, but it is unable to act on the real and therefore to realize itself (75). The past is 'powerless,' and it must borrow its vitality from the present perception (155). In order to be revived an image must come back from the heights of pure memory down to the precise point where action is accomplished (166).[1]

What is localized in the brain is not the image itself, but the motor mechanism without which the past and of itself powerless image could not become real and present (111). The brain does not preserve images, but 'simply chooses, in order to bring to distinct consciousness by the real efficacy which it confers upon it, the useful memory (souvenir), the memory which will complete and enlighten the present situation with a

[1] "Tous les faits et toutes les analogies sont en faveur d'une théorie qui ne verrait dans le cerveau qu'un intermédiaire entre les sensations et les mouvements, qui ferait de cet ensemble de sensations et de mouvements la pointe extrême de la vie mentale, pointe sans cesse insérée dans le tissu des évènements, et qui, attribuant ainsi au corps l'unique fonction d'orienter la mémoire vers le réel et de la relier au présent, considérerait cette mémoire même comme absolument indépendante de la matière." P. 194.

view to the final action' (197). It serves to recall the useful image, but still more to keep away all others for the time being (194, 195). This theory of localization is the only one that is able to explain the facts (111 ff.).

From these views the author draws conclusions on the union of body and mind, which need not be analyzed here. For our present purpose the main point is that memory is an essentially mental fact, which however cannot be exercised without the help of the organism.

(*c*) Physical Theories.

The writers whose views we have mentioned so far agree in this, that a mental activity is absolutely and essentially necessary to memory. For some, the mind is the only factor of memory; even retention must be attributed to it. For others, both mind and organism concur in retention and reproduction. Others finally insist on physiological dispositions; but as these are not sufficient for memory, which includes recognition, they also insist on the necessity of a mental activity to complete the phenomenon of memory. We have now to mention others for whom memory is primarily and essentially an organic function, secondarily and accessorily a mental one. They either overlook the fact of recognition, or consider consciousness as an unnecessary, accidental adjunct of organic memory. If they admit a mental activity, they allow it only a very small, unimportant function; it is a superaddition to that which is already complete; or it is a form hitherto imperfectly known of physical energy.

Ribot[1] rejects all 'psychological residues,' and admits only modifications of the nervous centers. "Memory is a general function of the nervous system. Its basis is the property of those elements to retain a modification which they have received and to form dynamic associations." Retentiveness depends chiefly on nutrition of brain elements and on blood circulation; so that retention and reproduction which are the essence of memory are fundamentally biological phenomena. Conscious-

[1] *Les maladies de la mémoire,* ch. I., p. 27 ff. and conclusion, p. 163 ff.

ness, recognition, localization in the past, are but a complement, a perfection. Hence we have the use of such expressions as 'organic memory' which differs from psychological memory only by the absence of consciousness. " La mémoire organique ressemble en tout à la mémoire psychologique sauf en un point, l'absence de la conscience " (7). One is thereby reminded of Malebranche's statement already quoted, in which, however, the term ' habit ' is used for ' organic memory.' " If there was no perception correlated to the course of the animal spirits and to the traces left by them, there would be no difference between memory and the other habits."

Richet speaks of memory as being 'a physiological phenomenon,' and asserts that it is "the fixation for a protracted time of an excitation which has set the cerebral nervous system into motion for a very short time. Briefly stated, memory is the prolongation of an excitation."[1] In the same manner, Luys calls memory the organic phosphorescence of brain elements. It is ' a true synthesis of one of the primordial properties of the nervous elements.'[2] " The elements of the cerebral substance, unconscious agents of the manifestations of our psycho-intellectual life, work silently at the operations which they accomplish in common. . . . They concur simultaneously to produce the phenomena of memory, and separately give off reminiscences, as illuminated bodies give off the luminous waves which they have stored up in their substance." All this is a ' marvellous power of the cerebral cells.'

Jodl holds that all trace is ' physical, material, organic.' Memory, *i. e.*, ' the conservation of received impressions, their transformation into potential energy and their permanence in this form,' is 'a common function of organic matter.'[3]

Edridge-Green, in his work on *Memory and its Cultivation* proposes an entirely physiological theory; he distinguishes two kinds of memory: sensory and motor.

[1] 'Les origines et les modalités de la mémoire,' *Revue philosophique,* XXI., p. 581. ' De la mémoire élémentaire,' *ibid.,* XI., p. 545. Cf. *Essai de psychologie générale,* esp. ch. 7.

[2] *Le cerveau et ses fonctions,* P. II., l. II., esp. ch. 1, p. 111.

[3] *Lehrbuch der Psychologie,* p. 463 ff.

Maudsley and Carpenter admit only physiological residua, *i. e.*, 'some modification of the nerve element, whereby the nerve circuit is disposed to fall again readily into the same action.' Such disposition appears in consciousness 'as recognition or memory.' Psychology can be of no help in this matter, and when it describes memory as a faculty of the mind, 'it does no more than present us with a name in place of an explanation.' There are only organic dispositions which, stimulated from without, constitute recognition, *i. e.*, cognition with memory of former cognition; and, stimulated from within, constitute recollection.[1]

Dr. P. Sollier's theory of memory[2] is also essentially physical. After a historical review he devotes three chapters to the analysis of the act of memory: fixation, conservation; evocation, reproduction; recognition, localization. The fifth chapter is a theory of memory, its evolution, seat, mechanism. All these are and must be explained by the properties of the nervous system, by the ' trace-disposition ' left in the brain, and by the brain's specific energy (cf. esp. p. 194, and summary, 202). Psychical manifestations must be reduced to brain activity. "All that we know of the mind, though it be little, manifests it as a form of energy, and consequently as belonging to the order of physical phenomena." " Outside of the nervous system there is no psychical energy." If we want to know the mind, what we have to study is the conditions of production, propagation and conservation of nervous energy. " The problem of the soul, in the main, is probably nothing but a problem of physics and mechanics " (cf. conclusion, 217, 218). The best point of view to be taken is that of ' pure physics,' rather than that of physiology, and Sollier's favorite comparison is taken from electricity.

Nature of Physical Dispositions.

We have seen that psychical dispositions are declared, by those who admit their existence, to be of an unknown nature; we

[1] Maudsley, *Physiology of Mind,* ch. IX., pp. 513 ff. Carpenter, *Principles of Mental Physiology,* ch. X.

[2] *Le problème de la mémoire* (*Essai de psycho-mécanique*).

must be satisfied with knowing their effects and comparing them with physical dispositions with which they have some analogy. Such is not the case with physiological traces; these are described at length, and the various theories which have been proposed can be reduced to three.[1] We can conceive of those traces: (1) as a movement persisting in the brain; (2) as a trace, a residuum, a fixed impression, persisting in the brain; (3) as a tendency to a certain function, persisting in the brain. We have noticed in the preceding pages that there is no clearly defined limit between the three theories of psychical, psychophysical and physical dispositions. Each one easily merges into the others, and sometimes it is difficult to know where a writer belongs, because he is, so to speak, on the border line of two theories which we have distinguished for the sake of clearness in our exposition. Here also we must notice that the division of the views concerning the nature of physical traces is perhaps more theoretical than real. "As held by recent writers, says Burnham, they are closely related and merge into one another. The movement and the trace may cause the functional disposition. The functional disposition itself may, in the last resort, be due to persisting movement" (*l. c.*, 574). Or, as Fouillée expresses it, 'au point de vue philosophique, il suffit de combiner les deux formes du mécanisme, mouvemens persistans et résidus persistans, pour obtenir des modifications stables de structure cérébrale, qui entraîneront une *disposition* à reproduire certains mouvemens déterminés' (*loc. cit.*, 367). Consequently to mention a writer as advocating one form or another must not be understood exclusively, but as meaning that he insists more on a special point of view, although he may not exclude, and may even positively admit the others. Moreover, it must not be overlooked that many illustrations and many expressions are evidently metaphorical, and must not be taken literally as a strict interpretation of the facts.

[1] Cf. Fouillée in *Revue des deux mondes*, 15 mai, 1885. Burnham in *American Journal of Psychology*, 1889, p. 571. Ladd, *Outlines of Physiological Psychology*, p. 420.

Persisting Movement.

The theory of persisting movements seems to be implied in comparisons that are sometimes proposed to illustrate the fact of memory. Thus memory is compared to a tuning-fork which continues to vibrate for a long time. It has been shown experimentally that the nervous elements have the same property.[1] An electric current passing along a wire leaves no trace whatever of its passage; all has ceased in twenty thousandths of a second after the current has passed. But there is a great difference, if instead of a wire, we make the current pass through the nerves or the spinal cord. "Any excitation, whatever it may be, leaves behind it a more or less protracted vibration which persists for a long time after the real duration of the excitation. . . . A short excitation determines a very long vibration of the nervous substance." We may say, although the expression is not correct and accurate, that there remains a 'latent vibration, which implies a greater excitability of the nerve, as a result of preceding excitations.' This phenomenon can be compared to memory, which is also 'the prolongation of an excitation.'

Luys develops the same theory.[2] He applies the term 'phosphorescence' to 'that curious property which the nervous elements possess of remaining for a longer or shorter time in the state of vibration into which they have been thrown by the arrival of external excitations.' We find an analogy in phosphorescent substances which, after having been illuminated by solar rays, continue to shine after the source of their light has disappeared. For we know that ether vibrations, in the form of luminous undulations, can be prolonged by phosphorescent bodies for a longer or shorter time, surviving the cause which has produced them. Niepce de Saint-Victor has shown by his experiments that luminous undulations may be garnered up in a sheet of paper and remain as silent vibrations, ready to reappear even after months, if the paper is treated by means of special appropriate reagents. Moreover the daily practice of

[1] Cf. Richet, 'La mémoire élémentaire,' *Rev. philosophique,* XI., 540 ff.
[2] *Le cerveau et ses fonctions,* P. II., l. II., pp. 105, 106 ff.

photography shows that certain substances can preserve persistent traces of the light vibrations which have affected them. The nervous elements also have the property of preserving some kind of prolongation of the impressions (ébranlements) which have set them in motion. They are gifted with 'a sort of organic phosphorescence; they are capable of vibrating and storing up external impressions, of remaining for some time in a kind of transitory catalepsy in the state of vibration in which they have been incidentally thrown, and of producing a revival of the first impressions after a certain lapse of time.' Many examples and experiments are reported by Luys to show that in some cases there is a prolongation of the nervous vibration and of the corresponding sense perception.

Taine[1] compares the stimulation of the brain cells to a dance which is continued and propagated from similar cell to similar cell. Even after the stimulation has ceased, the dance continues fainter and fainter in the background of consciousness.[2]

Persisting Impression.

The second theory which explains the physical basis of memory by the retention of a persisting impression, residuum, trace, is implied in many of the metaphors which are used. Thus we have seen the mind compared by Plato to a wax tablet on which our experience is written. We have mentioned Aristotle's '*τύποι*' and Locke's inscription on tombs. We also have the famous 'tabula rasa,' representing the mind before it has acquired any knowledge.[3] Taine uses a similar expression. The mind is like a stereotype-plate the size of which is different in various individuals; or rather it must be compared to a col-

[1] *De l'intelligence,* P. I., l. IV., ch. I., §VIII.

[2] "Une cellule des bureaux inférieurs qui rayonnerait dans l'écorce par dix cordons, chacun de cent cellules, aurait mille répétiteurs dans les hémisphères, et l'on concevrait comment, au deuxième, au troisième, au dixième, au centième plan, une danse précédente se prolongerait sous forme d'image, sans faire obstacle à la danse actuelle, c'est-à-dire à la sensation du premier plan" (p. 311).

[3] "Ὅτι *δυνάμει πώς ἐστι τὰ νοητὰ ὁ νοῦς ἀλλ' ἐντελεχείᾳ οὐδέν, πρὶν ἂν νοῇ· δεῖ δ οὕτως ὥσπερ ἐν γραμματείῳ ᾧ μηθὲν ὑπάρχει ἐντελεχείᾳ γεγραμμένον.*" Aristotle, *De anima,* III., 4, 429b, 30 ff.

[4] *De l'intelligence,* P. I., l. IV., ch. I., §VIII., p. 313.

lection of such plates. Every brain cell receives and preserves impressions, and these combine with one another, so that we have a multitude of representations, in the same way that the same letters by their various combinations can form a multitude of words.[1] Hence the brain cortex is like a 'printing office' (315).

Another illustration of the same view is the comparison with a phonograph.[2] The brain keeps the trace of past impressions as the tinfoil of the phonograph keeps the records of the sounds, by minute and almost imperceptible changes produced on its surface, so that 'it would be neither too inaccurate nor too strange to define the brain a phonograph infinitely perfected, a conscious phonograph.'

Richet, as we have seen, advocates the theory of persisting vibration, which, however, may be 'entirely latent'; but he also speaks of 'permanent' and 'indelible' traces[3] which are left in the psychic nerve cell. Whereas the muscles and the organic nerve cells do not retain any permanent modification after they have been stimulated, the psychic nerve cell is forever modified in its constitution, and 'this modification can be effaced only by the death of the cell' (565). It keeps an echo or resonance (retentissement) latent, prolonged, indefinite, of the excitation which has indelibly modified its constitution (567).

We can also mention, as pointing to the theory of persistent modifications, expressions which are frequently used, such as paths of least resistance, trodden, beaten paths, etc., metaphors which were used even by Descartes and Malebranche.[4]

[1] "Deux groupes reliés de la sorte peuvent être comparés à un cliché plus ou moins étendu, cliché d'un mot, cliché d'une ligne, cliché d'une page; la lettre entraîne le mot, qui entraîne la ligne, qui entraîne la page. Dès lors on comprend à quoi servent les cinq cents millions de cellules et les deux milliards de fibres de notre écorce cérébrale; grâce à leur multitude, notre mémoire est pleine de clichés. . . . Quatre cents millions de lettres font mille volumes, chacun de quatre cent mille lettres; si un cerveau humain contient quatre cents millions de clichés mentaux, cela lui fait une riche bibliothèque de réserve, et il lui reste encore cent millions de cellules pour les usages courants."

[2] Guyau, 'La mémoire et le phonographe,' *Rev. philos.*, IX., p. 319.

[3] 'Les origines et les modalités de la memoire,' *Rev. philos.*, XXI., 561 ff.

[4] *E. g.*, cf. James, *Principles of Psychology*, I., 107 ff., 653 ff. Taine, *loc. cit.*, 299.

Persisting Tendency.

The third theory, that of functional disposition, implies that there is in the nervous centers, once they have been stimulated, a tendency to perform again the same function, to repeat the same process. The point of view is not so much the present as the future, not so much the actual change or modification as the future process which it tends to reproduce. Thus Wundt speaks of the functional disposition acquired by the eye which has been accustomed to measure distances. These dispositions 'do not consist in a persistence of the function itself, but in the facilitation of its return.'[1] Ribot speaks of 'dynamic associations' which are established between the nerve cells.[2] Professor Baldwin[3] says of the physiological habit which explains retention, that it is 'a matter of modification of brain and nerve structure or function.' The organism is disposed to reproduce its former function; 'the execution of movements, at first difficult, becomes easy, then semi-automatic, and often irresistible.'

The best analogy to explain memory, according to Dr. Sollier,[4] is that of the physical phenomena of electricity. The comparison is used in many places in his work. The author does not mean that these two classes of phenomena have the same nature (216). If he insists on such analogies, 'it is not to establish the least resemblance of nature of the psychical with the electrical phenomena'; it is only to show 'that we can find in the purely physical world forces capable of modifying matter so as to impart to it new qualities, without apparently modifying its form or molecular structure,—qualities which are transitory, and which, after their disappearance, leave it in its former state' (53). We cannot give the details of these analogies, we can only mention the most important. (*a*) In most cases, activity leaves a trace-disposition (51). (*b*) The brain is compared to a storage battery; both are accumulators of energy (168). (*c*) This energy is released and made use of, under

[1] *Grundzüge der Physiol. Psychol.*, III., 565. Cf. Criticism of Wundt by Volkmann, *Lehrbuch der Psychologie*, I., 407.

[2] *Les maladies de la mémoire*, ch. I.

[3] *Senses and Intellect*, 157, 162.

[4] *Le problème de la mémoire, passim.*

conditions which are in many points similar (172). (*d*) We find in both cases a certain resistance on the part of the accumulator (195). (*e*) Phenomena of resonance are observed in both orders (206). Hence lastly, Dr. Sollier insists in many places on the 'potential' of the brain centers, which increases with their functioning (108 ff.). "The increase, the accumulation of successive activities is an increase of potential, analogous to that which is produced in an electric accumulator" (195). "The evocation of images does not depend so much on the play (mise en jeu) of a determined molecular state, as on the quantity of potential which at a given moment is at the disposal of the brain centers" (111).

Other writers more explicitly still combine the three theories of persisting movement, impression, disposition. They hold that these are only stages and degrees of one and the same complete explanation. Jodl describes the physical 'Spur' as a 'physical impress, a determined position and grouping of the molecules in the nervous centers'; also as 'a functional disposition, a latent state of energy (Kraftzustand).'[1] Höffding speaks of it as a tendency to repeat the same process, resulting from a certain state of the molecules, by which they are enabled to be excited more easily out of their state of equilibrium.[2]

Ebbinghaus uses the following comparison.[3] A new cord used for the first time to tie up a trunk is stiff and difficult to knot; after it has been used several times this becomes easier. Some change therefore has been produced and remains. This modification evidently does not consist in the permanence of the 'being-knotted' in a weaker form, but in structural modifications, which, although they bear no similitude to knots, make the cord more flexible and easier to knot. In like manner the after effects of nervous processes consist in structural changes. These changes depend on functions of which they are effects and results; they are the cause of the reappearance of these functions, although they are of a different nature.

[1] *Lehrbuch der Psychologie,* 463 ff.
[2] *Psychologie,* 194. Cf. also Rehmke, *Lehrbuch der allgem. Psychol.,* 259.
[3] *Grundzüge der Psychologie,* 52.

We have mentioned Taine's illustration of cell dances. A conscious state may have disappeared ten or twenty years ago. It may not have been recalled once during the interval, so that it seemed to have altogether vanished. Yet it can be revived; the dance of the cells has not been going on uninterruptedly; after several minutes, or several hours, it has been transferred to the most remote cell-groups where finally it has ceased to exist. But a stereotype-plate (cliché) has been preserved, that is, 'a modification of structure in a remote group of cells and fibers, an organic predisposition, *i. e.*, the predisposition to vibrate according to a given order, and consequently the necessity, for the nervous current which will reach that group, to flow in the path already open.'[2] This group may for a long time remain inactive, far from 'the broad way which our usual impressions follow.' Having so few chances to be excited and caused to vibrate, it may remain unnoticed for years; and it is only by chance that a cerebral current being directed there, the cells will again "enter into dance." When this happens the nervous current follows the trodden path. "Every one of the cells begins its dance in the preëstablished order; and this order and succession of dances, propagated from group to group through the cortex, comes forward from the background to the foreground."

Summary of the Modern Disposition Theory.

It has been shown in the preceding pages how widely admitted by modern psychologists is the theory of dispositions. We have presented it especially in its relations to memory; but it is clear that it is also the basis of habit. So-called organic memory it nothing but the habituation of the organism to certain functions, and requires physiological dispositions. Psychological or conscious memory is the basis of mental habit; it is explained by dispositions left either in the mind itself or in the organism, whose processes condition the mental processes.

A disposition, whatever name it may receive, trace, residuum, vestige, etc., whether we make it psychical or physical, implies

[1] *De l'intelligence, l. c.*, 314.

two things: an actual state and a potential relation or tendency to reproduce a past process or function. It supposes a persisting modification of movement or of structure and also a tendency to some effect as its correlate. "Jeder Disposition kommt . . . ein actuelles Correlat zu."[1]

Stout speaks of the correlate or an organic disposition in a different sense, to signify, not the effect which it tends to produce, but the corresponding psychical disposition. Even if a psychical disposition is 'a fainter discharge of function,' it does not follow that we can call it a 'presentation' existing in subconsciousness, because in order to be 'presented,' a certain intensity may be necessary. And if molecular movements persist in the brain it does not follow that their 'correlate' in the mind is the same idea which corresponds to a fuller and intenser discharge of function. "The preëxisting fainter activity can only be regarded as a physiological disposition correlated with a psychical disposition, and not as an actual functional activity correlated with an actual presentation."[2]

It is true that we must not overlook the actual state, condition, movement, which is an essential constituent of a disposition. But we must also avoid the other extreme of admitting nothing but such an actuality, and of neglecting the tendency which results therefrom to reproduce an idea which has not persisted all the time.

Thus the modern idea of disposition is not that of a 'naked' or of an 'hypostasized' possibility, but rather an idea of causal relation existing between an actual and more or less permanent condition of a subject as the basis of the disposition (Dispositionsgrundlage), and its results or function (Dispositionscorrelat) as effect. The effect must therefore have a double cause, the 'Dispositionsgrundlage' and the stimulus which is required to actualize it. The stimulus is a sensation, or the presence of some idea in consciousness.[3] And so, "in the

[1] Höfler, *Psychologie*, 21.

[2] *Analytic Psychology*, p. 26.

[3] Cf. Stephan Witasek, 'Beiträge zur speciellen Dispositionspsychologie,' *Archiv für systemat. Philos.*, III., 1897, p. 273 ff. Höffding, 'Ueber Wiederkennen, Association und psychische Activität,' *Vierteljahrschrift f. wissents. Philos.*, XIII., p. 420.

attempt to recollect, . . . whether the revival actually takes place . . . depends on the excitability of a preëxisting disposition. . . . The mere retention of a presented content in consciousness involves the continued excitement of a psycho-physical disposition, and is conditioned by its excitability, which in turn is partly conditioned by the supply of nutrition to the brain."[1]

We cannot close this chapter without referring to the definition of disposition given in Baldwin's *Dictionary of Philosophy and Psychology,* the article being signed by Baldwin and Stout. We must notice that the word disposition is sometimes used in a much broader sense than the one we have considered, to mean even those aptitudes and tendencies which arise from our very nature, temper, character, circumstances of life, and which give our mental life a particular direction and impulse; they are in many cases transmitted to us by heredity. In that sense it is possible to speak of dispositions of representations, judgment, feeling, desire; dispositions to the comical; innate, natural dispositions, etc.[2] But it seems better to restrict the meaning of the term disposition to express those tendencies which are the result of personal activity. In the other cases it is preferable to use the word predisposition, which has 'an innate character,' and refers 'to the permanent elements of character and endowment recognized as ingredients in temperament.' A predisposition is 'an inherited tendency to act in certain ways . . . , an inherited disposition.'

Hence disposition, if applied to the nervous system is ' the tendency of a nervous center, system, or element to function in a particular manner, either from native endowment or from previous functioning.' In accordance with what has been said, however, this definition can be further restricted to the result of previous functioning, excluding the native endowment which is a predisposition. A disposition ' has functional reference,' and is used to translate the German ' Bahnung ' ' which includes the actual canalization or anatomical path-making which results from continuous nervous discharges in the same direction.'

[1] *Stout, op. cit.,* 23, 24.

[2] Cf. Höfler, *Psychologie,* §12, 21. Lipps, *Grundthatsachen des Seelenslebens.*

Applied to mental life, a disposition is 'an effect of previous mental process, or an element of original endowment, capable of entering as a coöperative factor into subsequent mental process.' (We have again to remark that, according to Baldwin himself, the element of original endowment seems to be strictly speaking a predisposition.) The two elements of a disposition are clearly indicated in the definition; it is some permanent effect of previous activity, but also a capacity to determine further activity. "On the mental side, the characteristic thing about disposition is its preparatory influence in the determination of subsequent states of mind." It is really a 'coöperative factor,' although it be actually at rest without manifesting its latent energy, which, however, it is ready to give forth when it has the opportunity. 'It represents impulse or habit under arrest. Considered with reference to the event towards which its determining influence is directed, it enters into expectation'; which is the 'belief that future experience will be of a definite sort, based upon past experience.' If we consider the development of an acquired disposition, we can say that 'the typical rise and gradual growth of an acquired disposition is a function of accommodation through a series of exercises.'

CHAPTER IV. Existence and Further Determination of Psychical Dispositions.

1. Existence of Psychical Dispositions.

Necessity of Some Permanent After-Effect.

If we admit that reproduction is not the reappearance of the same presentation which had sunk beneath the threshold of consciousness, that it is not merely the coming forward of that which had been hemmed in and kept in the background, but that it is truly a *re*production, or production anew, then we must admit some one of the above-mentioned theories of traces or dispositions which are effects of previous, and co-factors in, subsequent mental processes. For we must admit that something really remains of a past mental state. The man who does not know is not the equal of the man who knows, although the latter may not actually have his knowledge present to consciousness.[1] There is a difference between the man born blind and the man who has experienced sensations of sight but now keeps his eyes closed; between the man whose ear has never been trained to discriminate musical sounds and the musician who is not actually listening to such sounds. Not to know a thing and not to think of it are widely different, says St. Augustine, because a man can know without thinking of what he knows. Can we say of a musician that he does not understand music because he is now thinking of something else? Or because he may be actually thinking about geometry, is that a reason to assert that he understands geometry?[2]

Even if the actual contents of consciousness in two individuals were of the same nature, and extended to the same number of things, still there would be a very great difference between those persons, because one has the possibility of recalling to consciousness a multitude of ideas, images, feelings, emotions, which have

[1] Cf. St. Thomas, *Quaest. disp. De veritate,* q. 10, art. 2.
[2] *De Trinitate,* l. XIV., c. VII.

no access to the consciousness of the other, and because of the ability of each to perform certain actions which are impossible for the other. Even if it were possible in such a case that the actual conscious states of both should be similar, no one would assert that they are exactly equal, because their respective 'powers' differ. The possibility of recall and representation is therefore something real, having a real, actual basis, and depending on past experience. This real basis is what we call disposition.

The primary object of this dissertation is not to prove the existence nor to give a complete explanation of psychical dispositions, but to examine the logical aspect of the theory. Still we must briefly indicate the principal reasons why purely organic dispositions seem insufficient, and why psychical dispositions seem necessary to the complete interpretation of the facts.

Materialism.

If the mind is assumed to be nothing but a function of matter, if all the phenomena of our conscious life are reduced to some form of material activity and energy, then, of course, the question of psychical dispositions is at once discarded; a disposition is merely the tendency of the nerves to repeat the same vibration, to undergo the same modification which produced the former conscious state. It does not fall within the limits of the present investigation to discuss the position of materialism. The assertions that thought is but a function of matter, that consciousness can be reduced to physical motion, that matter and its properties explain all our inner life, have been thoroughly criticized. The famous tenet that 'brain secretes thought as the liver secretes bile' would hardly find adherents among serious thinkers of the present time. We may say that materialism in this crude form is commonly abandoned to-day. It 'testifies rather to a man's respect for the mechanical order of things than to his powers of reflection.'[1]

What takes place when, for instance, at the sight of an enemy, or the hearing of an insult, a feeling of anger is

[1] Fullerton, *A System of Metaphysics*, p. 260, published before in *Psychol. Rev.*, March, 1902, p. 172.

aroused in me? The expansion of the optic nerve in the retina, or that of the auditory nerve, is stimulated and undergoes changes, modifications the nature of which is but imperfectly known. This visual stimulation is transmitted by means of the optic nerve to the optic center in the brain. There certain reactions are produced; the circulation may be affected, and blushing will result from the affluence of blood to the face. Motor nerves may be stimulated, the final result being the movement of the arm dealing a blow at the enemy. However imperfectly known these processes and the multitude of others which we do not mention, may be, yet some of them can be perceived and accurately described by the physiologist. What he is ignorant of to-day he may come to know in the future by closer observation and the use of more perfect instruments. Although there are certain processes which he cannot observe, he knows that these consist essentially of movements occurring in such a place, with an intensity which we conceive as measurable. Nor are the physiological processes knowable to one only, but to as many as can observe them.

But there is something else which the offended person alone can feel, something which is inalienably his own and the perception of which can be shared by no other. It is the internal, the conscious series of phenomena, the vision of a certain person, the hearing of a certain sound, the recognition of an enemy or the perception of an insult, the various ideas which are then suggested, the passion or emotion which ensues, etc. These sensations, feelings, memories, are also real, as real and more real to ourselves than the movements which correspond to them in the organism. And yet it is impossible to reduce them to a motion of material particles, to localize them in a definite part of the brain or of the nervous system, to measure them. Moreover they can be perceived only by the one individual who is the subject of them. 'In dem vorgefundenen Objekt nennen wir psychisch, was nur einem Subjekt erfahrbar ist, physisch, was mehreren Subjekten gemeinsam erfahrbar gedacht werden kann.'[1] Physical facts are 'public property'; psychical facts, 'private property.'[2]

[1] Münsterberg, *Grundzüge der Psychologie,* p. 72; cf. pp. 65–77.

[2] Royce, *Outlines of Psychology,* ch. I., p. 2.

These are brief indications of the reasons why modern psychology admits two series of facts which it recognizes to be distinct. "To regard as identical classes of experiences which are evidently dissimilar is inexcusable, and to dismiss as non-existent all classes of sensations except those which fit into a particular series, arbitrarily narrows the meaning of the word 'existence' to a special use. Both in science and in common life we constantly speak of colors, sounds, and odors. We mean something when we do so. To declare such things to be non-existent is palpably contrary to common sense and to the accepted usages of speech." If we confine ourselves to the study of nervous processes and to those special events in which they have their inception and in which they terminate, "what becomes of sensations, memories, thought-processes? A whole world of things seems to be left wholly out of account, ignored as though it were non-existent. Shall we outrage common sense by insisting that these are but another name for the nervous processes themselves, and hence do not require independent investigation?"[2]

Double Series.

There are therefore in ourselves two distinct series of facts, the mental and the physical, which, so far at least as they are known to us from experience, must be acknowledged to be irreducible. We do not have to inquire now into the relations which exist between the two series. One may say that they run strictly parallel to each other, never coming into contact, that they are perfect strangers having nothing in common. Or one may say that both can enter as successive factors in the same series of events. Or again one may assert that they are manifestations of the activity of two distinct substantial principles, or that they are merely 'aspects' of one and the same reality.

But even in monistic theories the mental and the physical series are opposed to each other as irreducible. The terms themselves which are used indicate sufficiently such an opposition. Parallels are necessarily distinct, and have such a direction that

[1] Fullerton, *A System of Metaphysics,* p. 254.
[2] *Ibid.,* 247.

they can never meet. Two ' aspects,' two ' sides,' two ' faces ' even of one and the same reality cannot be identical. The inside is opposed to the outside, the subjective to the objective point of view. Even in monistic theories therefore it is possible to admit psychical and physical dispositions, since we have to explain the sequence of the phenomena which form each series. These two series 'are on two utterly different platforms,' writes Clifford, the first author who advocates the so-called 'mind-stuff theory,' "the physical facts go along by themselves, and the mental facts go along by themselves. There is a parallelism between them, but there is no interference of one with the other."[1]

Bain also, according to whom we must speak of 'one two-sided phenomenon,' of one 'two-sided cause,' of the mental and the physical proceeding as ' undivided twins,' admits nevertheless that ' these two phenomena (of mind and body) have very little in common; they participate only in the most general attributes, namely, quantity, co-existence and succession, and even as regards these their participation is limited.' There is a 'very broad difference' between them.[2]

For Spencer, mind and nervous action are ' as the subjective and objective faces of the same thing.' The 'true conclusion' is that 'one and the same Ultimate Reality . . . is manifested to us subjectively and objectively.' Nevertheless " the very distinction of Subject and Object . . . is itself the consciousness of a difference transcending all other differences. So far from helping us to think of them as of one kind, analysis serves but to render more manifest the impossibility of finding for them a common concept—a thought under which they can be united. . . . Can we think of the subjective and objective activities as the same? Can the oscillation of a molecule be represented in consciousness side by side with a nervous shock, and the two be recognized as one? No effort enables us to assimilate them. That a unit of feeling has nothing in common with a unit of motion, becomes more than ever manifest when we bring the two into juxtaposition."[3]

[1] *Lectures and Essays,* 'Body and Mind,' Vol. II., p. 33.
[2] *Mind and Body,* pp. 122, 133.
[3] *Principles of Psychology,* Vol. I., §§62, 273.

Many other passages from these and other writers could be quoted, but those which we have produced sufficiently show, whatever be the logical consistency of the position, that even where the mental and the physical are declared to be 'one and the same reality,' they are nevertheless spoken of as absolutely different; they 'have very little in common,' are 'on utterly different platforms'; and each one 'goes along independently by itself.' Psychical dispositions are admissible in these theories in order to explain the mental series.

The terms commonly used to express the relations of body and mind would lead us to assume that there are psychical dispositions. In the physical series which corresponds to the mental, we have certain modifications and changes which are results of past functions and partial determinant causes of subsequent processes. To both physical processes which are respectively the origin and the result of the disposition correspond mental processes. Hence if we are to have a complete parallelism between the two series and to give an independent explanation of each, we must also admit mental dispositions, corresponding to organic dispositions and accounting for the continuity and the connection of the mental series, as the organic disposition accounts for it in the organic series. We have seen above that this is the argument used by Ebbinghaus: psychical dispositions are necessary to account for the causal nexus of mental states in the same manner as physical dispositions are necessary in the physical series. But leaving theories for the present, let us examine the facts themselves, and try to find what sort of dispositions their explanation requires.

Retention and Reproduction.

Memory as a psychological faculty includes: (1) retention; (2) reproduction; (3) recognition and localization in time—of a past conscious process. With the first two conditions mental habit is intimately connected, while it rather tends to exclude the third. The term memory, as we have seen, has sometimes been used in a much broader sense to include all retention of impressions in organic matter. To this usage it is justly ob-

jected that 'the idea of consciousness is so deeply involved in the connotation of the word that it should be restricted to its ordinary, limited use.'[1] Ribot's 'organic memory' is no memory at all, but merely habit, as Malebranche had more wisely called it. The same must be said of Luys' 'unconscious reminiscences,' which, since they are unconscious, cannot be called reminiscences. The modification and tendency of the nervous system to reproduce the same processes it has gone through "is no more fitly called 'organic *memory*' than are the molecular alterations produced by generations of use in the wood of an old Cremona."[2]

If we consider the first two stages of memory, retention and reproduction either of simple or of associated processes, it cannot be denied that the organism is an important factor. In view of the recent investigations on memory, its diseases, its different localizations in the brain, and also on the ability of the nerves to preserve traces of received impressions and dispositions to renew them, we can no longer with Hamilton and others already mentioned neglect physiological explanations as being 'too contemptible even for serious criticism.' On the contrary, "most psychologists admit to-day that the *retention* of knowledge is a physiological property of the brain cortex. The psychical fact which has ceased to be conscious has ceased to exist; that which remains is a purely organic modification." The lesson which the school boy has learnt is not in him in the form of unconscious ideas while he is playing with other boys; and yet he knows it and soon will prove that he does by reciting it. What he has in himself is a disposition which consists in 'an acquired property of his cortical substance.'[3]

Even if I have made no effort to commit an idea to memory it may recur unexpectedly after long years of absence, and for this reason it is doubted whether an idea which has once been present in the mind can ever be forgotten. It may remain dormant for a very long time, and suddenly without apparent

[1] Burnham, 'On Memory,' *Amer. Journal of Psychol.*, 1889, p. 269.

[2] Ladd, *Elem. of Physiol. Psychology*, §21, p. 554.

[3] Edm. Goblot, 'Théorie physiologique de l'association,' *Rev. philosophique*, Vol. 46, 1898, p. 489.

reason flash into consciousness again, perhaps with greater vividness and greater accuracy of details than many other frequently repeated ideas. Numerous cases are on record of the revival, after many years, of impressions which had scarcely been noticed when they were first received. This happens especially and more strikingly in certain pathological cases.[1] We can never say of any impression that it has utterly and forever vanished so as never to recur.[2]

When an idea has once been in the mind, whether we intentionally have tried to store it up or not, it may be revived; and for this result, according to some psychologists, it is sufficient to admit the permanence of physiological dispositions. All our mental states have their necessary conditions in brain processes, and therefore when, owing to a stimulation from without or from within, the physical disposition is excited and the cerebral process repeated, the corresponding mental process is also revived. And if the impression received in the organism has been modified by blending and associating with others, the reproduced process also will be modified in consequence, both in the organic and in the mental series. Thus the so-called association of ideas is nothing in reality but the association of organic processes and dispositions. Mental habit is reduced to organic habit; the facilitation in the reproduction of mental actions, the tendencies of the mind, are nothing but the consequence of the organic functions with which they are correlated.

We need not stop to consider the objection which is sometimes urged, that the brain is not able to store up a sufficient number of impressions to explain all our ideas with their infinite number of associations and combinations. The known prop-

[1] Cf. Taine, *De l'intelligence,* P. I., l. II., ch. II.

[2] "Une multitude d'objets et d'événements oubliés reparaissent à l'improviste. L'esprit subitement peuplé de leur foule remuante, ressemble à une boîte de rotifères desséchés, inertes depuis dix ans, et qui tout d'un coup saupoudrés d'eau, recommencent à vivre et à fourmiller. . . . On ne peut pas assigner de limites à ces renaissances, et l'on est forcé d'accorder à toute sensation, si rapide, si peu importante, si effacée qu'elle soit, une aptitude indéfinie à renaître, sans mutilation ni perte, même à une distance énorme." Pp. 131, 134.

erties of the nervous elements seem to furnish a satisfactory answer.[1]

A difficulty which the theory of physical dispositions has to meet arises from the fact of metabolism. The elements of our body are little by little renewed; they are in constant flux. The building up by assimilation of external particles of matter and the breaking down by giving back to the inorganic world other particles which were a part of our body is a process that never ceases. The nerve elements are not exempted from the general law, but are constantly coming in and going out.

It is true that the change takes place slowly, gradually, and as all the nerve cells communicate with one another, and none is isolated and independent, we may say that a disposition left in a certain group is not lost, but persists even after the whole group has been destroyed. It is communicated to the newly introduced elements by those which remain, for all form the same continuous network, or what Taine calls a ' cordon continu.' If from time to time a new stimulation reinstates the primitive process, the aptitude to reproduce it is given a new force and can thus be perpetuated without loss. Otherwise it is difficult to conceive that such an aptitude does not grow weaker and weaker, and finally disappear. But we have seen that it is doubtful whether a sensation ever so completely disappears that it cannot be revived even after a very long interval. Taine's rotifers, it is true, are reanimated by a few drops of water sprinkled upon them, after being apparently lifeless for many years; but in the meantime they have not changed. It is more difficult to conceive that after many years of inactivity the cells in the remotest corner of the brain, having been changed several times successively, have nevertheless kept the disposition acquired by one of their predecessors to reproduce the ' former dance,' and that they have not lost any of the 'characters' and 'types' which were impressed on them. However the difficulty, great as it may be, is not perhaps insuperable. The properties of the nervous system are but imperfectly known. The theories on the nature of its activity, of the traces left and of their inter-

[1] Cf. Baldwin, *Senses and Intellect,* pp. 157 ff. Bain, *Mind and Body,* ch. V. Ribot, Sollier, etc., *op. cit.*

communication are more or less plausible hypotheses, but they are not conclusions established scientifically in all cases. Science, as it becomes more perfect, discovers more marvellous properties of the nervous substance; perhaps nervous retention and communication will also receive full and complete explanation.

The same objection may be urged from a slightly different point of view. It is a well known fact that in old age it happens that early impressions occur with greater vividness than later impressions; the earliest seem to be the most lasting. An old man may forget recent important events, and have a perfect remembrance of impressions, sometimes insignificant in themselves, which date back to early childhood. Aristotle explained the absence of memory in children and in old persons by saying that their organ of memory is in constant flux, increasing in the former, in the latter decreasing.[1] To-day we are told that the brain substance in the child is softer and more plastic, and receives impressions more easily. Moreover, as the characters printed on it are few, it follows that it preserves them more distinctly and can reproduce them more vividly. This is true; but in the old man who now remembers, the brain elements have lost their plasticity and their aptitude to easily receive impressions. They have lost their facility for entering again into vibration and repeating their 'dances.' And yet it is to such elements that former residua and traces have been transmitted. The various materials of the brain have been renewed several times. Former dispositions must have been communicated to the new elements which are hard, inflexible, and have entered into numerous different combinations and dynamic associations. They must have been transmitted through long successive generations of brain cells, and they are reproduced now in all their vividness, while strong impressions, received directly from the actual sensations themselves, are feeble and soon obliterated. It is indeed difficult, if retention is a function of the brain alone, to explain how the same brain matter keeps a stronger disposition to reproduce a long forgotten idea, the vividness of which

[1] *De mem. et rem.*, 450b, 5 ff. Cf. above, p. 29.

should have weakened in the process of transmission, than to reproduce recent and more striking ideas.

The main objection, however, against the theory which makes of retention and reproduction a cerebral function is that the excitation of an organic disposition can never give anything but an organic process, which is *toto coelo* different from the mental state. The fact to be explained is the return to consciousness; and if the brain does not produce thought, if the action of body on mind be denied, how can we explain conscious reproduction with purely physical dispositions? "There is needed a parallel reproductive activity in the mind itself. However wonderfully the nascent-motor excitations might work, the product would be non-existent for the mind unless it build it up within and for itself."[1] For this reason, many psychologists, as we have seen, require psychical dispositions even to account for retention and reproduction.

Recognition.

Even if we could account for simple reproduction by admitting only organic dispositions, would it be the same if we considered the two other stages of memory, recognition and its complement, localization in time? Without recognition, simple reproduction would be of no avail to us. We might acquire habits of reproduction, a tendency to perform the same actions, to go through the same processes, and yet not even be aware of the repetition. Recognition includes a comparison of the present with the past. It is the consciousness of a reëxperience, not only the absence of a feeling of newness, or a certain vague familiarity with the object presented, but the positive identification of the present with a definite past state of consciousness.

The fact of recognition is frequently overlooked by those who make of memory a purely organic function, or it is passed over in a few words which contain no explanation. They tell us how an experience can be reproduced, and immediately take it for granted that it must be recognized. Thus Maudsley holds that "to recollect is to revive these experiences in the

[1] Bowne, *Metaphysics*, p. 396.

highest centers, the functions of which are attended with consciousness; to stimulate by external or internal causes, their residua, aptitudes, dispositions, or whatever else we may choose to call them, into functional activity. Stimulated from without, they constitute recognition, that is, cognition with memory of former cognition; stimulated from within, they constitute recollection."[1] According to Guyau also,[2] if the phonograph record was endowed with consciousness, it would, from the fact that they are repeated, recognize old tunes already played.

Yet the two facts must be distinguished; we may have repetition *de facto,* and the experience may be new for consciousness. We know that in many cases a state of consciousness which is repeated may not be recognized as a repetition. The same book may be read, the same tune listened to, and yet appear to be new. The image of a past presentation may return to consciousness, and the fact that it is an image of some object formerly known, be unnoticed. Ideas, expressions, sentences, verses, tunes, etc., may occur to consciousness with the apparent novelty of a discovery, and nevertheless be the reproduction of past experience. A trace had been left by the former presentation, which now, being stimulated, gives actual repetition without recognition. "It is an assumption made by many writers that the revival of an image is all that is needed to constitute the memory of the original occurrence. But such a revival is obviously not a *memory,* whatever else it may be; it is simply a duplicate, a second event, having absolutely no connection with the first event except that it happens to resemble it. . . . Psychical objects . . . simply recurring in successive editions will remember each other *on that account* no more than clock-strokes do. No memory is involved in the mere fact of recurrence."[3]

The theories of recognition are numerous;[4] to explain and discuss them is outside the plan of the present study. But we must notice that exclusively physiological solutions are obviously

[1] *Physiology of Mind,* p. 515.
[2] *Revue philos.,* IX., 319 ff.
[3] James, *Principles of Psych.,* I., 649.
[4] See Baldwin, *Dict. of Phil. and Psych.,* where they are exposed methodically.

inadequate. Even were they sufficient to explain the reproduction and the frequency of certain ideas, they would not suffice here. Recognition means more than that; one must not only have the same idea, but also perceive its relation of likeness, agreement, similarity, identity with a past idea. As cognition is essentially a mental act, so also is recognition; and how could the mind identify the present with the past experience, if it had not kept in itself some vestige or trace of the past experience? To quote again Professor Bowne: "Repetition is not memory. Reëxperience is not recognition. If then the brain were a storehouse of ideas, and should continually present them before the mind, there would be nothing to suggest to the mind the fact of reproduction, unless the mind had an independent power of recognition in itself. . . . The brain-register alone could never bring us to a knowledge of the past unless the mind had in itself an independent power of memory."[1] Hence Professor Ladd calls all the attempts to explain the recognitive activity by physiological conditions 'hollow and vain.'[2]

Even if the facilitation of the nervous process could impart to the mind a certain sense of familiarity in consequence of which the object would reappear with some kind of 'Bekanntheitsqualität,' this would not yet be recognition, *i. e.*, the identification of the present idea with one that is passed and remembered as such individually.[3] I may be aware of the facility with which the present process *a* occurs to consciousness; this would lead me at most to infer that it must have occurred before. But it would not lead me to the positive act of referring *a* to an individual past state *A* which has been present at such a given time, under such or such determined circumstances.

Recognition is an essentially relative knowledge, and the *fundamentum relationis* cannot be merely in the organism, but must be found in the mind itself. Whatever be the nature of the psychical action known as recognition, whether we insist on

[1] *Introd. to Psychol. Theory*, p. 84.

[2] *Psychology, Descriptive and Explanatory*, p. 399.

[3] On the 'Bekanntheitsqualität.' See Höffding, Psychologie, 166 ff. Also *Vierteljahrschrift f. wiss. Phil.*, Vol. 13 and 14. Cf. Criticism by Rehmke, *Lehrbuch der allgemeinen Psychologie*, 498 ff.

attention, on reinstatement of apperceptive relations, on conation, feelings, expectation, etc., it remains true that the permanent link between two transitory cognitive acts, referred to one another as cognitions, cannot be anywhere else than in the cognitive faculty itself.

We should be led to the same conclusion if, instead of taking recognition and identification, we considered the act of discrimination. Such an act is more complex, for it implies reproduction and recognition, and then comparison. To say of the present sound that it is louder, more acute than a preceding sound, or of a color that it is darker or brighter than another perceived in the past, supposes that some disposition has been left in the faculty which is able to discern, to pronounce on the agreement or on the difference. If I compare three sensations of hearing *ABC* which have taken place in the past, with the present one *D*, and notice the individual qualities by which they differ, this supposes the recognition of the qualities of *ABC*, as this only can enable me to point out the differences. Of the corresponding series *abc* of processes in the brain and the nervous system I hardly know anything; and did I know all about them, it would be of no avail; such processes are material and not cognitive. The disposition uniting *abcd*, cannot explain my present mental act; but the mental processes themselves must have left some disposition in the mind.

For the same reason the perception of a causal connection between successive mental states requires psychical dispositions. In a series *ABCDE* . . . I may perceive that *E*, the present state, comes from *D*, which is passed, that *D* was the result of *C*, etc. How is this possible if these states have left no trace in the mind?

A physical event takes place at a given time; still it does not in itself and for itself bear its own date, but only for the mind that knows it. The mind alone can perceive the similarity of the present with the past; the mind alone can refer its own states to a definite period of the past; the mind alone can perceive the causal nexus between processes. In a word, the mind alone recognizes and localizes events in time, and this implies the existence of dispositions in the mind. If in the series

$M_1\ M_2\ M_3\ M_4\ M_5\ M_6\ .\ .\ .\ M_n$ (mental)
P_1—P_2—P_3—P_4—P_5—P_6 — — P_n (physical)

the physical processes alone are connected by dispositions, I understand the greater facility with which they occur; I understand also—if I admit some kind of causal relations between the two series—that the corresponding mental states which they condition are reproduced and facilitated by repetition. I may even understand in this last hypothesis a certain sense of ease and familiarity. But if there is nothing to unite $M_1\ M_2\ M_3\ M_4$ . . . M_n ; if there is no mental disposition, I cannot understand that these former states are known to me as having occurred so long ago, under such circumstances. I cannot understand that the present M_6 is recognized as a repetition of $M_5\ M_4$. . . . M_1. Recognition is exclusively in the mental series, and therefore must be accounted for within that series. Neither cognition nor recognition are found in the physical series. If $M_1\ M_2\ M_3$ . . . M_n, are sparks of consciousness corresponding to $P_1\ P_2\ P_3$ . . . P_n, and vanishing at once entirely and forever, leaving no trace or disposition, it seems impossible that dispositions left by $P_1\ P_2\ P_3$ . . . P_n should enable me to recognize or discriminate the mental processes, or to perceive their causal relation.

Determination of the Future.

The argument is not always so cogent if, instead of considering the disposition as resulting from the past and explaining the present, we consider it as resulting from the present and preparing the future. In some cases, it is true, this point of view would not differ essentially from the preceding one and would lead to the same conclusions. I may now resolve to go and visit a friend at a given time in the future. When I execute my determination, a process of memory, and to some extent of recognition, takes place, for my present idea is recalled to consciousness either by spontaneous recurrence or association, or by a voluntary effort. Such a process, as we have seen, requires the presence of some trace in the mind itself.

But in other cases there is no conscious revival of the idea before the determined action takes place. The man who before

going to sleep makes up his mind to awaken at a determined time the next morning and succeeds in doing so, has not recalled his resolution to consciousness before the act takes place. More striking perhaps is the fact of post-hypnotic suggestion. I tell a hypnotized subject: in a week, on such a day, at such an hour, you will perform such an action. Then I arouse him; and at the appointed time the idea suggested by me, which has not been recalled in the interval, all of a sudden flashes into his mind, and he executes my command.

Such facts have not received as yet a complete and satisfactory explanation. Psychological as well as physiological theories are inadequate and are open to many difficulties. Perhaps the brain centers are capable of receiving a determined tension; then the resolution or the suggestion is like the winding up of a watch in order to make it run for a certain time, or rather like the setting of an alarm clock in order to make it ring at a certain hour. Its immediate effect would be to 'set' the brain centers so as to make them produce the desired effect. But can the brain centers keep time so accurately? And if instead of 'one' I say 'ten' weeks, how does such a slight change in my sentence have the marvellous result of making ten times longer the interval that elapses between my suggestion and its execution? In both cases, the disposition, if it is purely physiological, seems insufficient to account for the difference in the result; so that the mind has probably something to do in the revival of the suggested idea.

Whatever be the value of this last consideration, the other reasons given above explain why so many psychologists postulate psychical dispositions. These dispositions seem necessary to account for the facts of conscious reproduction, and especially for those of recognition. Let us now try to see what they are.

2. Possibility of Knowing Psychical Dispositions.

Objections and Answers.

Some psychologists, while admitting the existence of psychical dispositions, deny the possibility of ever knowing what

they are. They are, writes Lipps, of a 'completely unknown' nature; and Wundt adds that in the physical world we can in the future hope to understand better that which is now obscure, but for psychical dispositions there is no such hope, since they are unconscious, and the limits of consciousness are at the same time the limits of our inner experience.

Others reject the theory of psychical dispositions; they admit that if we consider it in regard to the facts it seeks to account for, it is sufficient and offers a satisfactory solution. But if we consider it in itself, a great objection against it is its obscurity. It accounts for the phenomena by something at least as obscure, if not more obscure, than the phenomena themselves. Once we have stated it nothing more can be said of it. Thus Rabier: "Nous croyons volontiers que cette opinion est vraie, et elle peut être adoptée concurremment avec celle que nous allons proposer tout à l'heure (*i. e.*, physiological habit). Elle a malheureusement un grave défaut, c'est que, quand on l'a énoncée, on a dit tout ce qu'il est possible d'en dire."[1] And Baldwin similarly: "As a description of the actual facts this is true" . . . , but "we do not at all explain the activity of memory. When we have called it a habit, a disposition, a permanent tendency of mind, what more can we say?" We can know psychical dispositions neither by analogy with the conscious states themselves nor by analogy with physical dispositions. In the former case we would fall into the theory of unconscious representations, since a fundamental disposition can only consist in a slight persistence of function. On the other hand, physical dispositions mean "combination or arrangement, a readiness of parts for a given result. But in speaking of presentations as functions, we cannot employ such a meaning."[2]

How far is this objection justified? We evidently must admit that we can have no direct knowledge of psychical dispositions. We call them psychical, not because they are conscious, but because they are found in the mental series, linking together states of consciousness, being an after-effect of one, and a tendency to reproduce another like the first. But the knowledge

[1] *Psychologie,* p. 159.

[2] *Senses and Intellect,* pp. 153–155.

which we have of physiological dispositions is not more direct and immediate than that of psychical dispositions. No one has ever observed those molecular groupings, those different movements, those feeble vibrations and oscillations, etc., which are supposed to account for the tendency to reproduce certain processes in the organism. They are possible, and may be to a certain extent necessary, but they have never been and can never be observed directly. Neither the brain when it acts nor its conditions of activity can be perceived by us; it is only by analogy that we can infer the nature of some of its states and activities. The same is true of psychical dispositions; we are not conscious of them, but we must admit them as causes and effects of conscious states immediately known to us.

But it is urged that the preservation of some after-effect in the nervous system once it has been stimulated has been scientifically demonstrated; experiments have shown that all excitation leaves an echo or resonance (retentissement) which makes further excitation easier. True; but has not our own inner experience shown that a mental state also exerts an influence upon a following mental state; that once it has been present in consciousness, there also remains a certain echo of it, which is not the persistence of the representation in consciousness any more than the echo is the continued uninterrupted sound? Those functions of retention which are attributed to the brain have an essentially psychological origin. They have been assumed as explanations of conscious reproduction.

We can, it is true, describe a physical disposition, and this is impossible for psychical dispositions; but here again we must be cautious. We have indeed numerous descriptions of the mode according to which the brain preserves impressions, but most of them are fanciful, and evidently must not be taken literally. The brain becomes a phonograph, a piano, a printing shop, a book, a wax tablet, a dancing hall, an electric accumulator, etc. Such comparisons used by serious thinkers show the difficulty of conceiving and of expressing how the brain retains. Metaphors in such great number and such great variety are indications of this difficulty, and frequently are used to cover the obscurity of an answer.

When an attempt is made at a scientific explanation, then we are offered different molecular arrangements, various motions and vibrations, and, as a result of all these, tendencies to certain functions. All these hypotheses are very plausible, but they are simply conjectures. Organic habit is an undeniable fact, but can we not say of it what was objected to the theory of psychological habit? "When we have called it a habit, a disposition, a permanent tendency . . . what more can we say?" The same questions arise: On what is it based? "Is it an ultimate law, or can it be reduced to simpler principles?" What is the nature of the law of habit? What is the 'tendency of a nervous center, system, or element to function in a particular manner, either from native endowment or from previous functioning'? There is 'an actual canalization or anatomical path-making which results from continued nervous discharges in the same direction'; and a 'preferential determination of a function, relatively to other functions, as to its pathway of discharge.'[1] This description may be the best that can be given in the actual state of science, but is it perfect? We easily picture the whole thing to ourselves, but how far is it a complete explanation of reality? We think of a torrent which forms its bed little by little, of a road which is enlarged and made more even; but we must beware of the fallacy which makes us conceive as true explanation that which our senses can easily represent. The 'Bahnung,' canalization, or furrowing of the brain might explain the facilitation if we admitted something like the 'animal spirits' of old,—this purest and subtlest essence of the blood,—which are constantly running through the brain, and from the brain to the body, and from the body to the brain. But physiology has not yet determined with certitude what is the nature of the nervous current. Some expressions frequently used in speaking of organic traces would lead us to believe that the nervous current is the motion of material elements which can enlarge their paths. The aptitude to repeat processes exists in the nerves and in the brain; canalization and path-making are attempts to explain it, but

[1] Baldwin, *Senses and Intellect, loc. cit. Dict. of Phil. and Psychol.*, s. v. Disposition; Facilitation.

as far as scientific conclusions go, such terms are metaphors and only illustrations.

But again one may insist that although tendency as such in the material world may be mysterious, still we can give an intelligible explanation of its actual basis: a different arrangement and combination of parts must influence the activity of the whole group, and hence tend to a given result. In speaking of psychical dispositions, this is impossible since the mind has no parts. In such an objection we seem to forget that we deal with a mental series the nature of which is different from that of the physical series. Of course we cannot speak of it in terms of matter; we cannot speak of parts and of their arrangement. But does this prevent the mental series from being real? Is not a conscious state as real as a motion of matter? Yet it has no extension; it cannot be measured; it is admittedly irreducible to material activity. Hence if both conscious and material processes are real and yet of different nature, is it to be wondered at that the disposition between two conscious acts is different in nature from the disposition between two material processes? Is the reality of the psychical disposition to be denied because we cannot reduce it to an arrangement of parts? We might just as well deny the existence of the conscious state because it cannot be reduced to material motion.

It is also objected that physical dispositions can be known from their antecedent and from their consequent, from the process which gave them rise and from the process to which they tend. But this again is forbidden us in the case of psychical dispositions, since they are an unconscious link between two conscious processes. Although the disposition of the nerve may be actually of an unknown nature, we may hope to know it later when observation has more accurate and more powerful means; at least we conceive of it as knowable and observable. We moreover have some knowledge of it from the knowledge of its cause and of its result. Psychical dispositions will forever remain unconscious, and we have no hope of ever observing them. Should our powers of introspection increase a thousandfold, they would not enable us to discover that which is out of consciousness. Finally, in matter we can think of

functional dispositions which are a slight persistence of the function, but in the mind the same assumption would lead us to the admission of unconscious presentations which are impossible and contradictory.

In answer let us examine how far we can know physical dispositions in the above-described manner. The future artist on the piano is now taking one of his first lessons; his fingers move awkwardly on the keyboard, his movements are full of hesitation; he has to consider attentively what key he must strike, with what hand, with what finger. Even when that has been decided upon, the finger performs with difficulty the movement which is commanded, mistakes are frequent, the wrong note is struck more than once. Compare this with the same individual's motions after he has become a skilful player; how sure they are, how graceful; no more hesitation; one can hardly perceive the quick motions of the fingers, and yet they always strike the right keys and in the right manner. Certainly a wonderful aptitude and disposition has been developed. But what is its nature? Shall the antecedent and the consequent playing manifest it to us? When the artist is not playing, his disposition and skill remain with him. We know that he has played, and this is the antecedent; we know that he can play if he chooses, and this is the consequent. But the disposition itself, what is that? It is insisted that it must be a 'slight persistence of the function.' Yes, but of what function? Certainly not of the piano-playing function, which therefore throws no light on the disposition *in se*. Two exercises on the piano are linked together by an organic disposition resulting from the first and facilitating the second. It may be "quite beside the mark to urge . . . that the effect of training a group of muscles is not shown in the persistence of slight movements during intervals of apparent rest. The absence of molar motions is no evidence of the absence of molecular motions."[1] True, but there is a certain confusion in this explanation. We seek to explain the disposition between two 'molar' motions, and we are told that it consists of 'molecular' motions. It may be so,

[1] Ward, art. 'Psychology' in *Encycl. Brit.*, p. 48. Cf. Baldwin, *op cit., l. c.;* Fouillée, *Evolutionnisme des Idées-forces,* p. 65.

but when we say that the disposition is a faint persistence of the function, we must mean, if we want to explain anything at all concerning the nature of disposition, that it is the persistence of the same or of a similar function, and this is evidently false. Molecular motions are widely different from molar motions.

This seems to be the weakness of the whole theory of unconscious presentations, of 'infinitesimal presentations so faint as to elude discrimination,' as Ward describes them. What remains in the organism after an excitation is supposed to be a slight persistence of it, and what remains in the mind is also supposed to be a slight, indiscriminated persistence of the corresponding presentation. This is purely gratuitous; we have just seen what we must think of the persistence of the organic function. Now, if to arouse in the mind a presentation, we must have in the brain correlative processes of a certain nature and of a certain intensity, can we say that a presentation will also correspond to other brain processes of another nature and intensity, and differing from the first as widely as the molecular motions differ from the molar motions in the pianist's fingers? "Surely the capability of being put into a mental state is itself a mental state and something actual, and is moreover a different something when the state to be reproduced is different . . . ; there must be something actual to justify the phrase 'latent power.'" Most certainly; but the assertion remains unproved that such 'actual' thing is an 'actual presentation,' any more than in the material world the molecular motions are identical with, or similar to, molar motions, or any more than a slight persistence of 'some' function and some molecular movement in the pianist's finger is a slight persistence of the piano-playing function, or similar to it.

How We Know Psychical Dispositions.

The conclusion of the preceding pages is that all dispositions, physiological as well as psychical, are obscure. Doubtless the notion of psychical disposition seems more obscure than the other because we have no concrete means of representing it to ourselves. But we have seen that even physical dispositions in

the organism are far from being explained. Ribot acknowledges it explicitly; after showing that memory requires special 'modifications' received and preserved in the nervous elements, he declares that it is impossible to explain the nature of these modifications; but facts and reasoning prove their existence.[1]

We may multiply illustrations and figures, use more or less accurate metaphors, describe even the smallest details in a manner which is highly imaginary; when all that is done, have we said what a physical disposition really is? No; a disposition, wherever it is, implies, it is true, an actual state which is its basis, but it is also essentially a correlative term. It is only in the abstract that we can speak of a disposition simply. All disposition is necessarily a disposition to, a tendency to, something. Therefore to a disposition corresponds necessarily some effect to which it tends. It is precisely by studying that effect that we can acquire some knowledge of the disposition. This does not manifest the disposition itself, but it may help us to frame theories. It is by considering what the organism does, by studying the effects of organic dispositions, that physiologists have been led to explain their actual basis by various hypotheses. When we speak of mental dispositions, the question is more difficult because its solution depends on the solution given to the larger problem of the nature of the mind. It leads us at once to the highest metaphysics of mental philosophy; and it is only after the question concerning the entity of the mind is answered that we can give a full answer to the question: What is a psychical disposition?

The attempt to limit ourselves to experience in psychology, and even in all other sciences, must necessarily prove to be a failure. "Just as in physical science, we account for observed facts by assuming unobserved conditions, so in mental science, we must transcend experience in order to explain experience. Only part of the factors which determine mental processes are definitely recognizable in consciousness."[2]

[1] "Il est impossible de dire en quoi consiste cette modification. Ni le microscope, ni les réactifs, ni l'histologie, ni l'histochimie ne peuvent nous l'apprendre; mais les faits et le raisonnement nous démontrent qu'elle a lieu." *Maladies de la mémoire,* ch. I., §1, p. 14.

[2] Stout, *Analytic Psychology,* p. 16.

The use of physical expressions to express non-empirical concepts in the language of experience gives them indeed an empirical appearance. But we must not deceive ourselves; a tendency, a facilitation, a disposition, wherever it is, and in whatsoever order of things, is a notion which is above experience. Dispositions are known from their effects in the same manner as we know a law from the observation of the phenomena. We can no more explain a disposition apart from its effects than we can explain a law apart from the phenomena which it is assumed to govern. To transfer into the physical order that which we can know only as belonging to the mental order is no help in psychological sciences.

Wundt therefore is right when he says that we can never have the immediate perception and knowledge of psychical dispositions; they are and must remain inaccessible to consciousness. Baldwin also is right when he denies the possibility of knowing the unconscious disposition from the conscious facts which precede and follow it, since it is not conscious; or from analogy with the physical disposition, since the psychical disposition cannot be conceived as resulting from an arrangement of material parts. However the general conclusion that no knowledge at all of mental dispositions is attainable does not seem to be justified. What we do not know from experience we frequently know by reasoning; what we cannot reach directly in itself we may perhaps reach indirectly by inferring the nature of the unobservable cause from the nature of observed effects. What is not perceivable by the senses and by imagination is not always unintelligible for our reason. If it were otherwise, what would become of all inductive sciences? We do not perceive a law of nature *in se,* but only in its effects and in the phenomena which it governs. Whenever we perceive the law, we perceive it *in actu, i. e.,* together with the effects which it produces. In the same way we never perceive the disposition itself, but we see it at work when it is actualized or aroused. We know it—as far as it can be known—simultaneously with the effect which it explains.

We must admit that our knowledge of psychical dispositions remains vague and imperfect, that it cannot be complete so long

as we do not have a clear, perfect, adequate knowledge of the nature of the mind; that therefore it will remain incomplete for a long time yet—if not forever. But this is no reason to reject the existence of psychical dispositions, or to despise the little knowledge we can have of them.

Without entering into the metaphysics of the human mind, we shall attempt briefly to define a little more the concept of psychical disposition, by a process of induction and comparison. We shall consider the effects of psychical dispositions and examine the analogy which these dispositions bear to certain other notions. A part of the work has been done already in establishing the existence of psychical dispositions, since they are based on facts which they are required to explain. Moreover some further considerations which may throw a little light on the subject will find their place in the next chapter.

3. Further Determination of the Concept of Psychical Dispositions.

The common effect of all habits and dispositions is an aptitude to reproduce a given process, and to modify following actions to a degree which varies with the strength of the disposition and the nature of the action performed. We can conceive of the possibility of a life in which every action once performed would disappear forever and leave no trace of itself. Such a life would be like a succession of views projected on a canvas, one view being seen for some time and then disappearing completely and influencing in no way those that follow. The same view may be reproduced several times, but there is no connection between any two productions; the fact that it has been exhibited already does not make it easier for it to be exhibited a second time. If other views have been projected meanwhile the canvas keeps no impression which would modify the reappearance of a former view. In the same way, in a life without dispositions and habits, the same causes would give rise to the same processes, but these would be entirely new for the mind and would have no connection with other processes. Man would begin his existence with certain powers and activities, but these would always remain the same; actions would

be repeated but not remembered, not made easier; exercise would not improve our faculties nor increase our mental power; progress would be absolutely impossible. But we know that such is not the case; we accumulate experiences, increase our knowledge and develop our faculties.

Dispositions and Consciousness.

We need not now insist on this aspect of the question; it has already been touched upon where we have spoken of reproduction and recognition. A psychical disposition is not conscious; yet it is an intermediate step between two conscious states. It is a kind of substitute for the mental process which it enables the mind to revive and recognize. Mental states succeed one another very rapidly; to keep an idea before the mind for a long time, by what Locke calls contemplation, is not possible. The effort and tension which are necessary cannot be long successful; the idea vanishes and gives place to another. But if it disappeared utterly and completely, without leaving any after-effect in the mind, consciousness would be a succession of disconnected scenes, all new, all beyond the influence of those that have preceded. The disposition is thus an essential factor in the mental series.

It is not only a direct link between two similar mental states, and is not necessary to memory only; it has a much wider influence and reaches a multitude of conscious processes, which it contributes to produce and which it modifies in many different ways. A mental state is always complex and the disposition partakes of this character. An idea, besides its representative aspect, is oftentimes connected with affective and conative states. The disposition which it leaves retains these relations and extends its own influence to different groups of operations, by resemblance, contrast, association, etc. An apparently slight and in itself unimportant experience is sometimes the turning point of a whole life and changes its course entirely, because the disposition left by it has been allowed to acquire a strong and general influence.

Our own common experience shows that one idea, especially if it is of an emotional nature, greatly modifies for some time

our views, the direction of our attention, and our own mental life. A deep affliction produced by the loss of a dear friend will greatly change the mental attitude, although the idea may not be actually in consciousness. Objects and conversations, which at other times would be of great interest, are now entirely devoid of it. On the contrary, other objects which before would have passed unnoticed take an unwonted importance, especially if they are related in some way to the lost friend. Other ideas will produce other effects, but all will have a certain degree of influence on other conscious states. This influence is greater when the disposition has been strengthened by frequent actualization, when it belongs to a more important mental faculty, when it has produced a habit, a strong and lasting tendency of the mind. This effect is what we must now consider.

Facilitation.

A disposition is a modification of mental activity, by which the mind acquires an aptitude to repeat the same process. Repetition has for its effect facilitation, *i. e.,* 'increased ease of function, or of disposition for it, resulting from stimulation of any sort.'[1] It is an increase of effectiveness which has reference to the overcoming of the obstacles which oppose the action and consequently diminishes the effort necessary to the production of that action.

Effort supposes some difficulty, obstruction, resistance, and means an intensification of activity in order to overcome these. Facilitation includes both the reduction of the resistance and the increase of energy. Hence facilitation implies readiness to act and ease in performing the action. The obstacles being removed, the obstructions leveled, the process must take place more easily and be accomplished in less time. Energy being increased, or at least being given a certain direction rather than another, will issue in action more readily.

If I must go to a certain place towards which there is no road, in a country little known to me, I am likely to find many obstacles which will delay me. Hills, fences, fields, the uncer-

[1] Baldwin and Stout, in *Dict. of Phil. and Psychol.*

tainty of the direction to be followed, losing my way, etc., are all so many difficulties which on the one hand will impede my progress, and on the other will exhaust my strength. I may reach my destination, but the process will be slow, and on my side the result will be fatigue and exhaustion. This travel can be facilitated in two ways. First, a road can be made, smooth and level, thus doing away with the impediments and hindrances. Then instead of walking I may use other means of traveling which will dispense with the exertion required in the former case, and will not necessitate the expenditure of so much energy. Both the making of a good road and the improvement of the means of transportation or the increase of locomotive energy combined will give the best result: rapidity of transit with less effort.

In our opinion, we ought to conceive of mental facilitation in a similar manner. The mental series cannot, it is true, be reduced to the physiological series, but still it is certain that both are in close dependence. Not all nervous processes are correlated with consciousness, not all have a mental side; but all conscious activity has a correlate in the organism, all mental process has a corresponding physiological process without which it could not take place. It seems that a great number of obstacles must come from the organism. It is needless to insist on the fact of physiological habituation which we have already mentioned. Our daily experience shows clearly that the repetition of certain movements makes them easier. Skating, dancing, fencing, swimming, piano-playing etc., become mechanical actions. Movements which at first were difficult and required continued effort and attention become automatic. The limbs acquire dexterity and suppleness; the nerves and muscles are ready to perform without hesitation certain coördinated movements. What is the exact nature of that facilitation we can hardly determine in the present state of physiological science. Metaphors of paths becoming level and smooth, of roads opened wider, of obstructions being removed, are good illustrations, but cannot be taken literally. As we have said above, we are obliged to use these analogies to explain facts that are absolutely certain.

Exercise not only removes the obstacles, it also increases the strength of the exercised organ. The muscles of the workingman are much stronger than those of the man who takes little exercise; the energy of which the organism disposes seems to accumulate there as a consequence of the repeated exercise. In the same way the brain acquires greater facility, greater energy by repeated functioning. Hence the facilitation of mental processes is explained partly by the acquired properties of the brain.

But on the mental side itself there are obstacles. Ideas may conflict with one another; previously acquired or native tendencies may oppose the recall to consciousness of a certain process. The mental process is real, although it is not similar to, or produced by, the physical process. Then why should not its production determine and modify the mind itself? The notion of a mental energy distinct from the energy of the brain is not acceptable to a great number of psychologists, and as we cannot discuss it here, we shall not speak of the possible increase of mental energy. Yet no one will deny that we have the power to perform mental work and that exercise greatly modifies that power. There is a development of our mental life, there is an increase of power to perform certain actions. By attention we apply ourselves to certain actions, and little by little the activity of the mind takes one special direction rather than another. As our mental power is limited, this tendency will probably affect other processes and make them more difficult.

In short, as in all living beings exercise of function means an increase of facility in the performance of that function, so in man the exercise of mental activity modifies the tendency of the mind, gives it a special direction towards those acts which have been frequently repeated.

Disposition and Habit.

The word disposition is frequently given a very broad and extensive meaning, referring to all tendencies whatever be their origin and their object. Sometimes also, the word is used in the Aristotelian sense of a weak, easily changeable habit. Or again the terms habit and disposition are used as synonyms.

Thus, in the question of memory, many psychologists speak indifferently of the theory of mental habit or of the theory of psychical dispositions. In this dissertation both words have been used and will again be used one for the other; yet a closer examination, without excluding the many points of contact, might show some differences between habits and dispositions in so far as these explain memory.

A disposition is left in the mind after only one experience, and it is probable that we never have an experience without preserving some trace of it. How many things can we not remember which we have seen, heard, perceived only once. Habit, on the contrary, is not so easily acquired. A man who performs an action once is not said to have the habit of it, and in order to become habitual the action must generally have been repeated many times. It is true that habit must begin with the first act in the series of those actions which we call habitual, but no one would call it a habit while it is at that stage.

Another difference is that while the psychical disposition sometimes, namely in memory, tends to bring back an idea to consciousness, habit always tends to weaken consciousness. Actual memory, or the image based on psychical dispositions, is the actual reproduction in consciousness of what had formerly been conscious. Habit renders less and less conscious the action which at first required a distinct conscious effort for every one of its elements, and tends to make it automatic. We may ask: What do we mean then by mental habit? When we speak of a good memory we mean the habit of easily, automatically retaining and reproducing past impressions. In what does this differ from psychical dispositions? We must distinguish two elements which make up a good habitual memory. There is in the first place the disposition which an idea has left and which tends to reproduce that idea in consciousness. But this disposition needs to be stimulated, actualized either by a new perception of some external object, or by an internal stimulus such as the presence of an idea in consciousness, according to the laws of association. In some cases this stimulation is not effected without conscious effort; we have to exert our mental activity, endeavoring to recall an idea of which we have only a

faint recollection. There are therefore in the disposition two things to be considered, the disposition itself and what Stout appropriately calls its excitability. An idea which can recur to consciousness because it has left a disposition does not always recur easily; there may be obstacles and difficulties; the disposition may be weak and need greater effort and stronger stimulation to be aroused. Repetition will strengthen it and make it more readily excitable. Habit has for its effect the ease with which the reproduction will be effected, the absence of conscious effort, the rapidity and certainty of the process. The disposition itself was present after the first action, even if it was not accompanied by attention; but the habit has required many a repetition, many an excitation of that same disposition, and now it consists in the easy, automatic, unconscious stimulation of it, and the consequent reproduction of the idea in consciousness.

According to the general tendency and attitude of the mind, to the nature and usefulness of the process, to the conditions and frequency of the revival, the idea is referred to the past in memory, or simply revived more easily in the present in the case of habit. This question, however, belongs to a more general problem of psychology: the relations of memory and habit.

Disposition and Potential Energy.

Dispositions are not unfrequently likened to potential energy, which tends to become kinetic or actual under proper circumstances. Thus Höffding: "When one speaks of traces, residua, dispositions, which remain after the sensations and presentations have vanished from consciousness, one takes for the basis of such an assertion the assumption that in the mental field something must take place analogous to the conservation of energy in material nature."[1] Stout mentions the excitability of psychical dispositions: 'All change and transition depend on the excitement of dispositions previously unexcited, or not excited in the same manner and degree.' Revival depends 'on the excitability of a preëxisting disposition.'[2] We have already

[1] *Psychologie*, p. 194.
[2] *Analytic Psychology*, p. 23.

mentioned Lipps, according to whom 'every disposition conceals in itself a latent presentation-force (Vorstellungskraft), or mental energy-of-motion (Bewegungsenergie) which is released when the disposition is excited by the stimulation (Bewegungsanstoss) coming from other presentations.' A disposition must not be understood merely as a transmission of energy, but it has an energy of its own and by means of this contributes to the final result. Finally Wundt compares psychical dispositions to the molecular arrangements of chlorine and nitrogen in their compound, nitric chloride. The disposition is no more of the same nature as the activity to which it tends than such molecular arrangements are of the same nature as the explosion which may result from them.[1]

When such comparisons are used they must not be carried too far. Both potential energy and dispositions suppose a permanent state, and a potential element or tendency to some effect. Both tend to actualization, exercise, kinetism, when the necessary conditions are fulfilled. Lift a pendulum and you thereby give to the weight a certain amount of potential energy. Let it fall, its energy becomes kinetic. By winding up a watch you store up in the spring potential energy which it will give forth in moving the whole mechanism. Gunpowder has in itself potential energy which results in the explosion. But it must be remarked that potential energy, when it becomes actual, reverses the process by which it had been accumulated. Open an ordinary door, it acquires no potential energy. But if the door is furnished with a spring that closes it automatically, the result is that when I open the door the spring is at once given a certain quantity of potential energy; it unbends when I release the door and thus closes it. Bend a stick or a steel bar, the potential energy communicated to it will tend to straighten it again. Throw a stone in the air, its potential energy will make it come down. The potential energy of gunpowder when released gives back the various energies which had been accumulated in it. We see from these examples that the actualization of potential energy consists in a reversing of the energy which had been stored up. And thus, if we take a simple ideal case, we

[1] *Grundzüge zu der physiol. Psych.*, III., p. 330.

can say that if the accumulation of potential energy took place according to several processes *a b c d e*, its release will consist of *e d c b a*. In reality it will be far more complex, at least in many cases, and the physicist has to take into consideration the various transformations of energy which may have occurred.

With dispositions we have something different. Exercise the arm, it acquires a disposition to repeat the same movement in the same order. The fingers acquire by practice a facility for repeating the motions necessary to play the piano or the violin. The ear, by listening attentively to various sounds, acquires the power to discriminate them more easily and more accurately. Memory brings back to consciousness a process similar to a previous process which had left a disposition. Recognition is the reproduced cognition of an object, referred to a previous perception.

We must not overlook this difference when we speak of dispositions as potential energy. Both are a storing up, a retention, but they differ as to the actual end towards which they tend. One is a tendency to action, to the reproduction of a process, the other tends to the production of an inverse process, to reaction or counteraction.

Main Characteristics of Dispositions.

If we now try to reduce to a few points the analysis of a disposition, we shall find the following:

1. It is a modification, a change of some kind in the being which we call 'disposed.' It really adds something, namely, a power, a tendency which was not there before. It directs the activity towards a given end. It is impossible for the man born blind to form any idea of color. However keen his other senses may be, they can never by associating and combining their different products give rise to a color-image. If we can bring back to consciousness images of colors previously perceived, if we can associate those images so as to form various colors and tints which we have never really perceived, it is because our sensations of sight have left in us some traces which enable us to revive the past impressions. All disposition must therefore be understood as a change produced by, and corresponding to a previous state. Even where we use the word in a more gen-

eral sense, for any tendency original or acquired, primary or secondary, it is always true that the present disposition is the remains of a past state of consciousness, or of a series of accumulated experiences.

2. Such a modification is not transitory like the state of which it is the result, but it is permanent and lasting. It connects transitory states of consciousness, and thus enables us to revive the past and even to a certain extent to foresee the future. Expectation evidently supposes a disposition left over from past experience. The shortest conscious process may give rise to the most lasting disposition. Notwithstanding the unceasing organic changes, and the successive tearing down and rebuilding of the whole body; notwithstanding the variety and flux of our states of consciousness; in spite of the constant change and succession of all these, the disposition remains although it may not manifest itself. After a whole life of apparent oblivion, events of childhood may come back to the consciousness of the old man.

3. Permanent though they are, ever present, and ever ready to produce their effect, yet dispositions are latent. Traces of conscious states and tendencies to reproduce them are themselves unconscious. No direct knowledge of them is possible, and we can never be aware of them except when they actually produce their effect. It is by observing what a disposition does that we are brought to admit its existence.

4. A disposition is the power which a subject possesses as a result of past activity, to reproduce the same process, to recognize the present state of consciousness as identical with or rather similar to a previous state. But such a power is modifiable; it is in the first place susceptible of increase and decrease. Generally speaking, in ordinary life, inactivity will diminish the aptitude of a disposition to revive a process, and in proportion to the length of time that has elapsed the fainter and the less vivid will be the new process. On the contrary, repetition strengthens it, makes it readier to be actualized with less stimulation. The ratio of this increase cannot be determined; so numerous, so complex, so little known are the factors which contribute to the revival of a past impression, that we cannot even make an attempt to determine the relative importance of

the factor which we call disposition. If conscious processes themselves as such are immeasurable, if we have no means of referring them to a common mental unit, much more is such determination impossible when we deal with unconscious factors. Weber's and Fechner's laws are in the present case of no avail in giving us the slightest clue towards an appreciation and a measurement, since the stimulus of a disposition is frequently within ourselves in the form of an image, and therefore eludes our control.

5. Increase and decrease are not the only variations which a disposition is capable of undergoing. Its direction can be changed. It affects other dispositions and is affected by them. It spreads out as it were into several channels, and influences states with which it has some relations of similarity, contiguity and the like. The dispositions combine in such a way that we can produce in consciousness states which we have never before experienced as such, but which are results of associations among the residua of past states. And as among the factors of conscious processes some are primary and fundamental, others secondary and derived, so also among dispositions some have a far greater importance and exercise a more widely spread influence than others. The psychologist, for instance, knows well that a subject who has been trained for a certain class of experiments will be much better even for another class than a new, untrained subject. Although experiments on the sense of vision have not improved his ear or his sense of touch, yet, when such experiments have to be performed, he has acquired the necessary and indispensable qualities of attentive observation, quickness of response and others, which wield an influence over all other senses.

In conclusion we may say that if the foregoing considerations have not given us a direct insight into the nature of psychical dispositions, they have manifested the most important of their conditions and effects. As we have already remarked, in order to proceed further and acquire a deeper knowledge, it would be necessary to consider the nature of the mind itself in which the dispositions are found, the nature of that series of psychical events which the dispositions explain and unify.

CHAPTER V.—Logical Aspect of the Theory of Psychical Dispositions.

In the third chapter of this dissertation it was shown that many of the most prominent psychologists of our time admit the existence of psychical dispositions. They believe that without them a satisfactory interpretation of mental processes cannot be given. The trace left in the brain can account only for the repetition of some movement or vibration in the brain. It is the after-effect of an organic process and a disposition to an organic process. But consciousness is not a form of movement, it is not a function of matter. The physical disposition can never explain the reappearance in consciousness, and especially the fact of recognition.

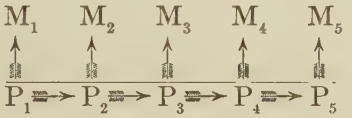
A question remains to be examined. Psychical dispositions themselves may require certain conditions without which they cannot be admitted consistently. Are there not certain requisites the neglect or rejection of which makes the theory an impossible one?

1. The Mind Series Theory.

Prevalent Conception of the Mind in Modern Psychology.

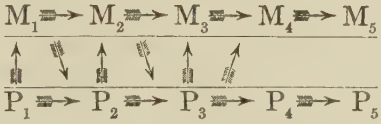
In examining the opinions of modern psychologists on the nature of the mind and of its relations to the organism, we find that, although they differ on many points, there is a feature in which they generally agree. It is the tendency to regard the mind as the sum of the successive manifestations of consciousness. Some exceptions are to be found, but by the majority of thinkers the concept of a substantial principle distinct from the body is abandoned. The mind becomes a collective term, synonymous with the totality of the mental states. It is what Taine calls 'la trame des événements,' and contains nothing but these events and their relations (liaisons).

Epiphenomenalism considers consciousness as an incidental effect, a superfluous accessory of certain brain processes. Consciousness is compared by Dr. Shadworth Hodgson to a 'spark thrown off by the engine,' to the 'foam thrown up by and floating on a wave,' to an 'aura or melody arising from the brain,' etc. Others, on the contrary, compare it to a shadow. Hence the conscious processes which constitute the mind are only epiphenomena; 'there is no real reaction of consciousness upon nerve, and no real action and reaction of states of consciousness upon each other.' The theory can be represented as follows: *P* standing for physical, *M* for mental, and the arrows indicating the relations of influence or causality.



We only mention this theory and do not have to consider it further, as it is but a disguised or mitigated form of materialism, in which psychical dispositions find no place.

Other psychologists admit interaction. There is a mutual influence of mind and body. A cerebral process can produce a state of consciousness, and a conscious process can produce changes in the organism. There are causal connections not only within each series, the physical and the mental, but also between them, thus:



and in the same causal series it is possible to have successively mental and physical elements, thus:

P ⇒ M ⇒ M ⇒ P ⇒ M etc.

The theory of interaction can be held in a materialistic sense if the mental energy be understood as a special form of physical energy. Or it can admit a real, substantial mind, source of

mental energy, acting on and acted on by the organism. Or finally it may admit that the mind is nothing but the series of mental states which accompany the brain processes, and which can in turn modify them.

Psychophysical parallelism, the theory in favor with most psychologists, holds that physiological changes are determined exclusively by physiological antecedents. In this parallelists agree with epiphenomenalists. But they deny that the psychical processes are secondary and that they are powerless shadows of the organic processes. The psychical and the physical form two parallel series which are not causally related to each other, but it is more commonly admitted that there are causal connections within each series. If these be denied in the mental series, we really have nothing but a special form of epiphenomenalism. There is therefore a mutual correspondence, a concomitance of two series of facts, but no interaction. Both series develop in parallel directions without ever coming in contact. Each is complete in its own line and goes along by itself, thus:

$$M_1 \rightarrow M_2 \rightarrow M_3 \rightarrow M_4 \rightarrow M_5$$

$$P_1 \rightarrow P_2 \rightarrow P_3 \rightarrow P_4 \rightarrow P_5$$

The correlation of mental and of physical states is not explained by either series, nor by the mutual relations of both series. The parallelist, in order to give an account of it, holds that both series belong to a more comprehensive system. In metaphysics the psychological theory of parallelism is expressed by the Spinozistic theory of identity or psychological monism. One and the same reality, one and the same substance manifests itself according to a double mode, the mental and the physical. We have only one fact with two 'aspects,' 'sides,' or 'views.' Considered from the inside, it is mental; from the outside, it is physical. This ultimate reality may be conceived, with Ebbinghaus, as something different from both the mental and the physical. Or, with Stout, it may be conceived as more adequately revealed in the mental. "One thing seems clear—that

we are nearer the truth in speaking of it as consciousness, than in speaking of it as matter."[1]

In general, modern psychology is not materialistic; but neither can it be called spiritualistic. It does not admit any substantial mind as subject and cause of the mental states. Some of the expressions which are used signify primarily a certain unity of manifold elements. With Hume, we may speak of the ego as of a 'bundle of impressions,' or with Mill, as of a 'series of mental states.' Others criticize such expressions and insist on the continuity, the uninterrupted succession of mental processes. States of consciousness are not units separated from one another; we have not so much a succession as an unbroken, unremitting flow. Thus Professor James speaks of the 'stream of consciousness.' Others bring into prominence the idea of dependence of one process on another, and the idea of order and cohesion. The mind, according to Ebbinghaus, must not be conceived as the 'Summe,' but as the 'Gesammtheit' of the mental states.

Whatever be the special point of view one takes, or the special idea on which stress is laid, the fundamental admission is that there is no mind distinct from the mental states.[2] We are justified therefore in speaking of this view generally as the mind-series theory. The mind is the actual sum of the coexisting contents of consciousness at any given time, and the series of successive mental states. The insistence on the continuity or the mutual dependence of those states is only a modification of the general view.

[1] *Manual of Psychology,* p. 54.

[2] "Unsere Seele ist nichts anderes als die Summe unserer inneren Erlebnisse selbst." Wundt, *Menschen- und Thierseele,* S. 492.

"Wir nehmen vorlaüfig das Wort Seele nur in demselben Sinne wie das Bewusstsein, den Ausdruck für die Einheitlichkeit unserer gesammten inneren Erfahrungen (Empfindungen, Gedanken, Gefühle und Entschlüsse)." Höffding, *Psychologie,* S. 41.

And Jodl still more explicitly says: "Die Seele hat nicht Zustände oder Vermögen, wie Denken, Vorstellen, Freude, Hass, u. s. w., sondern diese Zustände in ihrer Gesammtheit sind die Seele, gerade so wie die physiologischen Processe in ihrer Gesammtheit eben das sind was wir 'Leben' nennen, ohne dass dies als eine besondere Kraft oder Substanz neben ihnen existirte." *Lehrbuch der Psychologie,* Erster Teil, K. II., S. 31.

Quotations from other authors could be multiplied.

Series in General.

A series always requires several conditions: 1. There can be no series where there is no multiplicity. One thing considered by itself, or even several things considered as a whole, as a unity, cannot form a series. This unity can be only a part or an element of a series, when it is conceived as connected with other things and bearing certain relations to them. A series implies therefore in all cases a plurality of objects.

2. It implies also a succession, a following of one thing after another in time or in space. Kings who have succeeded one another on the same throne, successive events, actions, etc., can form a series. But a bundle of things, a heap, is not called a series, because the several objects are all together and not in a successive order. This succession is not necessarily real; it may be simply the work of the mind classifying its concepts of things according to a certain order.

3. This is not yet sufficient. The most important condition of a series is the connection, real or logical, of the several units that compose it. This is indicated by the etymological meaning of the word itself (lat. sero), which signifies a binding, a joining together. A series is not a succession of disparate or disconnected objects; it requires a certain unity arising from the relations which those objects bear to one another. Thus in mathematics we have arithmetical series, the terms of which increase or decrease according to equal differences; geometrical series, the terms of which increase of decrease by equal ratios. We speak of a series of persons, things, events, because they are connected by relations of causality, equality, similarity, etc.

Mental Series.

We find in the mind the elements that are common to all series. The multiplicity of mental states, their succession, is the most obvious fact that reveals itself to any one who considers them attentively. They are in a constant flux, always changing. Ideas, feelings, conative states, with their infinite variety, occupy in turn the field of consciousness. Their mutual connections also are facts of direct evidence; the presence of

an idea in consciousness may give rise to other ideas or emotions. Images associate, and the revival of one is the cause of the revival of another or of a whole group. There is a close dependence of one state on those that have been experienced before, and this dependence is explained by the psychical dispositions which persist through the successive changes in consciousness.

The series of mental states has special characteristics which we must notice. It is not composed of homogeneous units, but of states of different nature: cognitive processes, feelings, motor impulses. In each of these groups again, we find a great diversity, and never a complete likeness, since every act influences the following in different degrees.

The intensity of mental states also varies greatly. Sometimes it is such that they force themselves upon our attention. Even if we try to turn them aside, we are unable to do so. Their intensity may decrease, and repeated efforts may be required in order to keep an idea in consciousness, or to recall it after it has vanished. It may fall from distinct to obscure consciousness, then to subconsciousness, and finally, as far as we can know, depart altogether from the field of consciousness, leaving only an unconscious mental disposition.

What is true of individual mental states is also true to a certain extent of consciousness itself. It varies in intensity. Sometimes everything seems to be evanescent, to go away from us. Consciousness becomes fainter and fainter, and even seems to disappear altogether. Is it possible for consciousness to cease entirely? Can the mental series be discontinued for some time? Many psychologists give a negative answer. Even in the most profound sleep, in cases of swooning, fits of epilepsy, the use of anaesthetics, and the like, consciousness becomes weaker, but is never interrupted. This position is evidently beyond the possibility of empirical proof. Nor can the adverse position claim for itself any certainty but this: that we have no memory of uninterrupted conscious states at all times of sleep. We have dreams which we do not remember. It is also well ascertained in many instances that when we are aroused, if we at once reflect on ourselves, we have a faint and quickly van-

ishing memory of some feeble state of consciousness which has just been interrupted. Hence it is possible to dream all the time without remembering it in the state of wakefulness. But from the fact that we do not remember all our dreams must we conclude that we dream during the whole sleep? And from the fact that we find ourselves dreaming when we wake up in the morning can we infer that we have been dreaming the whole night? Is not the very fact of awaking sufficient to produce dreams? Uninterrupted consciousness is possible, but it cannot be shown to be a fact. Therefore, until the necessity of it is proved from other considerations, it is more prudent to limit ourselves to the data of experience. The problem is one of those that remain insoluble.[1] In consequence if we use such an expression as 'stream of consciousness,' it ought to be with the distinct understanding that the constant flowing of the stream is not proved.

If in the series of mental states we compare the present with the past, we find that it is an increasing series. Not that it can be compared to arithmetical or geometrical progressions, which increase according to definite and regular differences or ratios, for we cannot measure in what degree a mental state influences following states, and we know that this degree varies. Some processes are more important than others; some, after they have vanished from consciousness, leave a deeper and more durable trace, and have a far greater influence than others on our mental life. Mental experience always increases; ideas are preserved, not as idle entities, but as a 'circulating capital' which never ceases to be of use. The field of consciousness widens with each act, because all leave a modification which becomes a factor of following processes. Increase in the mental series is not so much a multiplication of the actual contents of consciousness at any given moment as a complexity of the factors which constitute or modify them, a perfection of the processes, and a facility in producing them. It is a power to revive the ideas which have left in the mind a permanent disposition.

[1] Cf. among other writers, James, *Principles of Psychology*, I., 199 ff. Hamilton, *Metaphysics*, lect. XVII.

Another peculiarity of the mental series is that its course depends on many factors, intrinsic and extrinsic. It does not proceed evenly, mechanically, but in a somewhat capricious manner. Its direction is likely to be changed at any time so as to take a course totally different from that which was expected or intended. An impression from the outside, an idea voluntarily or involuntarily recalled, may interrupt the train of thought which one had begun and substitute another in its place. It is impossible to determine the line which our thoughts will follow even for a comparatively short time.

The mental series depends largely on psychical dispositions. These form a permanent connection between the mental states; they explain their reappearance and the influence of one on the other; and they are important factors in the course which consciousness follows.

2. Psychical Dispositions in the Mind Series Theory.

Knowledge of the Existence of Psychical Dispositions.

If the mind is nothing but its successive states, we could, first of all, question the possibility of its knowing itself as a series. We believe with J. Ward that this paradox, as Stuart Mill himself calls it, is not possible, although Bain takes the contrary view.[1] If the series of mental states cannot be aware of itself as a series, it would follow that it cannot know the existence of dispositions. For the dispositions connect the various units of the series, and they explain the memory of the past states which constitute it. Let us, however, briefly examine the question on its own merits.

What conditions are necessary in order to know the existence of psychical dispositions? We must in the first place be aware of a change, of something that passes away. If the actual state of consciousness remains present, there is no need of a substitute, of a vestige. We cannot recall to mind that which has not disappeared; we cannot revive in consciousness that which has not vanished from consciousness. Secondly, when the re-

[1] Cf. Ward in *Encyclopedia Britannica,* XX., p. 39. Bain in *Mind,* XI., p. 459.

vival takes place, we must perceive the relations of the present state to the former. If it appears as entirely new and not as a reproduction depending on, and facilitated by, a former process, we can never be led to suppose that there has been a disposition left between the former and the present process. Thus, thirdly, we infer that although there have been changes, still something has remained permanent which enables us to perceive the relations of the present with the past.

Now if the mind is nothing but its successive states *A, B, C, D, E,* it cannot actually be anything but the present contents of consciousness *E*. The others, *A, B, C* and *D,* are past; they have disappeared, and so far as we directly and immediately know, they are absolutely non-existent. The present state *E,* does not contain *A, B, C* and *D*, and knows nothing of them, since they are at present out of consciousness. When *E* itself disappears and is succeeded by *F,* there can be no consciousness of change; not for *E* which has vanished, nor for *F* which is new and could not have known *E*.

Neither can it be said that, at any given moment, the contents of consciousness being complex, and their renewal taking place gradually, a part of *F* has really coexisted with *E,* or at least with a part of *E*. We can take the mental states at days, weeks, years of distance, and separated by numerous conscious states of different nature (perhaps separated by complete interruptions of consciousness). If my mind is actually the present mental state, *e. g.*, the hearing of a musical composition, together with the surrounding circumstances in consciousness, how is it that I can recognize this composition as the same which I heard several years ago? How can I compare one with the other? By what means can the present be referred to the past which perhaps has never before been recalled to consciousness? Without some spectator distinct from both *E* and *F,* this seems impossible. Without something permanent under the constant changes, we cannot explain the knowledge of those relations which oblige us to postulate psychical dispositions. Consciousness of reproduction, *i. e.,* recognition, consciousness of identity or difference, of facilitation, of causality, suppose something besides the ever changing mental states.

But it will be objected: What use is there of all such speculation? It is a fact that we do know these relations between our mental states. Even if the fact were unexplainable it would be no less certain. But it is easily explained precisely by the dispositions which all mental states leave in the mind; they are that permanent something which is required. We speak of the units that compose the mental series, but it must be observed that these units are all, by their very nature, related to one another. Consciousness is not represented as it should be when we make of it a series of separate states of different nature, *A, B, C, D, E,* for there is really no interruption, but a close succession of all these, and a dependence of one on the others. Moreover, *ex hypothesi,* we admit the existence of psychical dispositions, and the mind ought to be represented as follows: *AaBabCabcDabcdE,* the capitals standing for the actual conscious states and the small letters for the dispositions which they leave. When *E* appears in consciousness it comes with all the characters of dependence, and with all its relations to the past.

This leads us to examine another question. Can we conceive the mind in this way? Can mental dispositions exist if the mind be reduced to the series of the mental state?

Existence of Psychical Dispositions.

If in the course of the same mental series there are complete interruptions of consciousness—and we have seen that perhaps such is the case in sleep or other less frequent conditions—how can we explain the connection which is experienced by the mind, of the section of consciousness that precedes sleep with the section that follows it? Where are the psychical dispositions during that lapse of time? They are supposed to be contained implicitly in the conscious state—which together with them is the whole actual mind—and now consciousness has ceased. Yet when I am aroused in the morning, their effects are manifest; I remember what I did the day before. They have endured therefore even during the period of sleep. Where and how, in the absence of all conscious process?

Is it not this consideration which has led many psychologists to admit the uninterrupted continuity of consciousness, although there is no direct evidence for it? But supposing that consciousness never disappears entirely, and it may be so, will there remain no difficulty in admitting the existence of psychical dispositions?

The mental series is not homogeneous; the units that compose it are of different nature. They can be opposed to one another, or be so disparate that they hardly seem to have anything in common besides the general feature that they are all perceived in consciousness. As far as we are aware, the hearing of a sound does not influence, in some cases at least, a following visual process, a sensation of smell, the intelligence of complex problems, etc. Reasoning on mathematics does not apparently modify my appreciation of a picture or of a musical performance. To make every state of consciousness the accumulator of all past experiences seems to be an unwarrantable assumption. If we take the case of the revival A_1 of a process A, we may have between A and A_1 a multitude of other conscious states; we may have a whole life of experiences during which A has been forgotten. When it is recalled, it must be by virtue of the psychical disposition a. It is impossible to see where and how a has persisted through all the changes that have taken place; how, *e. g.*, a visual disposition has been transmitted down to the present time by successive sensations, emotions, conative states, etc., which are supposed to be and to have been the whole mind.

I may recall to my mind the idea of a song which I was taught twenty years ago. I remember vividly the circumstances of place, persons and effort. Most of the details are still present to my mind. Yet to the best of my knowledge this is the first time this idea has ever been revived; for twenty years it has been absent from consciousness. There was in the mind a disposition hidden and unnoticed which now produces its effect. How has it been preserved? Many ideas have occupied the field of consciousness: studies of French and English, of Latin and Greek, of history and poetry, of mathematics and geography have in turn required the whole attention of the

mind. Serious and ludicrous thoughts have succeeded one another; realities and fancies, in the waking condition and in dreams. The greatest variety of sensations have been experienced. At times the mind has been entirely absorbed in emotions of grief or of joy, of love or of anger. Let one reflect on all this for a moment, think of this multiplicity and variety, and supplement from one's own experience that which has only been indicated imperfectly above. If the mind means nothing but the successive mental states; if under these incessant changes there is nothing permanent, how can the disposition be preserved? How can it be transmitted? How does it produce its effect now? It is difficult, if not impossible, to understand how this can take place.

In addition there is an important principle which seems to be forgotten when such a theory is proposed: *mental states are processes, functions, not substances.* 'Die Vorstellungen sind nicht Wesen sondern Functionen,' says Wundt. St. Thomas had already made the same remark: 'Esse intelligens vel sentiens actu non est esse substantiale sed accidentale ad quod ordinatur intellectus et sensus.'[1] No psychologist would think of denying this principle. How then is it possible to admit the persistence of psychical dispositions without a substantial mind distinct from the mental states? Can functions and processes contain and transmit psychical dispositions? In the organism the functioning of an organ does not leave a disposition in the subsequent function, but in the organ itself. A brain process leaves a permanent after-effect in the brain, but we cannot say that it transmits it directly and immediately to the following cerebral process. When we assert the existence of psychical dispositions, and yet hold that the mind is the series of mental states or functions, we are in danger not only of giving substantiality to the conscious processes, but even of 'hypostasizing' the dispositions themselves which unite those processes.

A disposition cannot be found in the conscious states that succeed one another; nor can it exist by itself; we cannot conceive of it except in a permanent, stable subject. A disposi-

[1] Quæst. disp. De anima, art. XII.

tion is no less a disposition of, than a disposition to, something, and as it is supposed to be psychical, we are not allowed to make matter its subject. If there are psychical dispositions, there must be some real being in which they are and of which they are modifications. The mind cannot be represented as above *AaBabCabcDabcdE . . .* , which makes of conscious processes and of psychical dispositions something substantial, some real *Wesen,* but it must be represented as

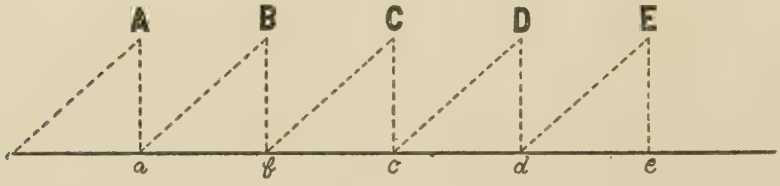


Fig. 1.

or perhaps better as

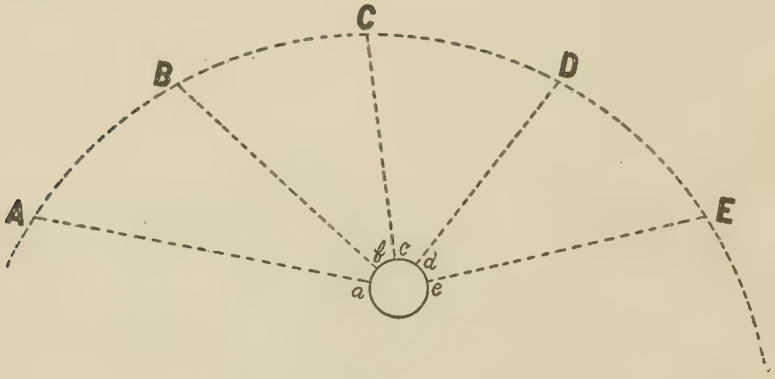


Fig. 2.

We have here something permanent, some real being, represented by the continuous line (in Fig. 1), in which the dispositions *a b c d e* are received; or by the central point (in Fig. 2) in which all conscious elements are brought to unity. We have a permanent mind, from whose activity mental processes can come. It can also receive the dispositions left by them. That which is modified by a disposition is not so much the following processes as the activity whence they proceed and the agent whose functions they are. We can understand that an

active subject is modified by exercising its activity, and that such a modification has a more or less marked influence on following operations. We can understand that a permanent being preserves a permanent disposition. That without such a being, in the series of mental processes, psychical dispositions can be preserved and produce their effect we cannot understand.

Bradley's Phenomenalism.

F. H. Bradley proposes an easy way out of the difficulty. To the objection that 'in the soul, at any one time, there will be for phenomenalism nothing but what is experienced at that time,' he answers:[1] "Not so, and this is a sheer mistake. For phenomenalism the soul is at any one time what is experienced at that time, but it is also more. For it is qualified also by the past which really belongs to it, and that past belongs to it not merely as what it has been, but as what it now is. The soul in other words *is* the dispositions which it has acquired. And if it is objected that with this we have gone beyond phenomenalism, I reply that once more the objection rests on a mistake. For the dispositions are simply statements about the happening of events within the phenomenal series, assertions as to what will happen, or rather would happen, under certain conditions more or less unknown. . . . Phenomenalism . . . uses these tendencies as facts, and in this it follows the example of every limited science. The dispositions are not phenomena, but they are legitimate fictions used to explain the happening of phenomena" (29, 30). A disposition in psychology is therefore "a mere way of stating that when some things have happened, there will be a 'tendency' for other things to happen" (34). We want mere statements of laws, and "it does not matter for your purpose, so long as these laws work, whether they possess ultimate truth or are more or less fictitious and false. . . . What, in short, we want in psychology are explanations that truly explain, and above all things, we do not want true explanations" (35).

What are we to think of this view? The soul, we are told, is not only what is actually experienced, because it is qualified

[1] 'A Defence of Phenomenalism in Psychology,' *Mind*, N. S., IX., 1900, p. 26 ff.

by the past which really belongs to it; it is the dispositions which it has acquired. This hardly removes the objection which was to be solved, that at any one time the soul is nothing but what is experienced at that time. For since dispositions are only *statements* and *fictions,* and since we have no right to consider them as real, it follows that the soul is what is experienced at the present time, plus certain laws and statements 'more or less fictitious and false.' One must confess that this *mere way of stating* is a very small addition to the actual state of consciousness, and that the soul is very little more than the present experience. We have here a reëdition of Stuart Mill's 'thread of consciousness supplemented by believed possibilities of consciousness.' But where do such possibilities come from? Why it is that 'when some things have happened there will be a tendency for other things to happen'?

Furthermore, 'the soul is qualified by the past which really belongs to it; and that past belongs to it not merely as what it has been, but as what it now is.' From the world of fiction we pass to the world of reality; but it is difficult to see how the past as such, the past '*as what it has been*' can now '*really*' belong to the soul at all, the soul being, *ex hypothesi,* the present experience, plus the qualification which it receives from the past. That which has been can no longer be; that which has passed from consciousness cannot come back to consciousness; the past as past can never be found in the present. A process similar to or analogical with a previous process can take place; the same identical process once performed cannot come back. The past therefore does not and cannot belong to the soul as 'what it has been,' but only as 'what it now is.' But now it is only a tendency, a disposition, *i. e.,* something which can be used only as a law, some 'mere way of stating' the sequence of processes, something 'more or less fictitious and false' . . . 'legitimate fictions used to explain the happening of phenomena.' How then can we speak of a past which '*really belongs*' to the soul? The soul is 'the dispositions which it has acquired.' By this statement the soul is evidently reduced to a minimum of reality. Moreover, what does 'it' stand for? Is there any phenomenal

subject acquiring dispositions? The soul *acquires* dispositions, and yet *is* the dispositions themselves!

When we have real facts to explain, we want—as far as possible—real, though perhaps not ultimate, explanations of them. Frequently, it is true, we have to be content with imperfect and temporary theories, when a better one is not at hand. 'Working' hypotheses may be found very useful, but can we draw the distinction between true explanations and explanations that truly explain? Can a statement, a law, if it be recognized as fictitious and false, be assumed as an explanation that truly explains? An explanation of real facts by something which we know to be a fiction is no explanation at all. Malebranche's occasionalism, Leibniz's preëstablished harmony—to give only two instances—certainly account, and perhaps better than any other theory, for the 'phenomenal sequence.' Why are they rejected, if not because they are too fictitious and imaginary?

The theory of psychical dispositions is proposed to account for certain real facts, and it is proposed as a real explanation. Let us now see whether and on what conditions it can account for them.

Dispositions as Explanations of the Facts.

The theory of psychical dispositions in modern psychology is proposed in order to explain the causal sequence in the mental series, the retention and revival of mental states, the facts of recognition and facilitation, the unity and continuity of consciousness. For the psychologist who on the one hand rejects the doctrine of materialism, and yet on the other does not admit any permanent substantial mind, these problems present a special difficulty which psychical dispositions are called upon to solve.

Ebbinghaus holds that the same necessity which obliges us to admit after-effects of nervous processes obliges us also to admit after-effects of their corresponding conscious processes. This is the necessary position of parallelism. The nervous processes are in causal relations with one another; so also must their mental 'equivalents' be causally related within the mental

series. We cannot deny that causality applies to the mind; conscious processes do not originate from nothing and do not end in nothingness.[1]

We fall here into the above mentioned difficulty of permanent mental dispositions without a permanent mental subject; of causal relations without a substantial agent. Dispositions are effects and causes of directly observable conscious states. As permanent effects, they require something besides the mental states to explain their preservation and transmission. As permanent causes, they must be given a certain power and energy, and this supposes a permanent agent, source and accumulator of energy. If the same necessity which makes us admit cerebral dispositions leads us to admit mental dispositions, can we not add: The same necessity which obliges us, in order to explain physiological dispositions, to consider the organism as an agent, permanent and substantial, obliges us also, if we admit psychical dispositions, to consider the mind as active, permanent and substantial? Whatever be the ultimate metaphysical theory one holds, when we speak of brain dispositions we do not consider the brain as the sum or collection of brain processes, but as something real, some *Wesen* underlying them, of which they are functions. The cerebral dispositions are in the brain, and not in the successive transitory brain processes. The same logic must apply to the mental series, and consequently psychical dispositions require more than the successive mental states.

The primary effect of psychical dispositions is retention, which is the basis of revival. Stout insists on this aspect of the theory. Retentiveness is an indispensable condition of progress and development. "It is impossible to formulate in words from the introspective standpoint the most ordinary facts of retentiveness and memory, without implying that past experiences leave behind them after their disappearance persistent traces on which their revival depends."[2] "Advance would be impossible unless the results of prior process persisted as the

[1] *Grundzüge der Psychologie,* Erstes Buch, §5, p. 53.
[2] *Analytic Psychology,* p. 22.

basis and starting-point of subsequent process. . . . Mental development would be impossible unless previous experience left behind it persistent after-effects to determine the nature and course of subsequent experience. These after-effects are called, in psychology, *traces* or *dispositions*, and the psychological law of retentiveness may be stated as follows: *when and so far as mental development takes place through mental conditions, it does so because specific modes of consciousness leave behind them specific traces or dispositions, which determine the nature and course of subsequent process, so that when they are modified it is modified.*"[1]

This explanation, true and valid as it is, cannot claim to be ultimate; the permanence of dispositions must be made possible, and we have seen that to this end certain conditions are necessary. 'Specific modes of consciousness leave behind them specific traces or dispositions,' on condition that the mind shall not be reduced to the mere collection and sequence of mental processes. The 'basis and starting-point of subsequent process' is not the disposition in itself, *per se*, but the disposition as a permanent modification of the permanent mind. If the 'nature and course of subsequent process' is modified, it is because the mind, whose process it is, has been modified by the disposition.[2]

Recognition, which, as we have said, depends essentially on the existence of psychical dispositions, shows also the impossibility of a simple series of processes without anything permanent and stable. Recognition is the judgment that the present idea is similar to an idea which is now past. Who can form such a judgment? Not the actual state, which has just come to consciousness, and could not have known its antecedent which perhaps has disappeared long ago. The present process cannot recognize its identity with the past. There must be something else that has been modified and affected in a certain man-

[1] *Manual of Psychology*, p. 76.

[2] "Nella memoria non sono propriamente le immagini che si conservano nella forma perfetta con cui appaiono alla coscienza, ma ciò che si conserva è lo spirito identico a se medesimo, lo spirito che dura con la forma che ha ricevuta dalle esperienze quotidiane, e le habitudini diverse che i suoi atti gli hanno lasciato." L. Ambrosi, 'L'immaginazione e l'inconscio nella vita pratica e nella scienza,' *Rivista Italiana di Filosofia*, Anno 1891, Vol. 2, p. 353.

ner, and perceives that it is now affected in the same manner. Recognition is not only the perception of similarity between two processes, it is also *ipso facto* the perception of self-identity. "What I remember recognitively I know as in the *past of time* and as belonging to *my* past, to the past of the *same Self* that I now am. This memory therefore involves not only ideation and comparing activity, but Time-consciousness, consciousness of Self, and consciousness of Self-Identity."[1]

It also involves in many cases a special effort, as when we are looking for an idea which has already been in consciousness, when we are trying to revive it by directing our associations, or when we endeavor to find in our past the idea similar to that which is actually present to the mind. In all these cases we are conscious of effort and activity. We sometimes say that owing to an acquired disposition, a phenomenon has a tendency to come back. This is an imperfect expression; a phenomenon, a process has no tendency; the subject alone tends and makes efforts. So immediate experience not only gives us the knowledge of the present conscious states, but also in many cases makes us perceive a subject active in their production, one amid their multiplicity, permanent under their perpetual flux, identical notwithstanding their constant change.

Frequent repetition produces facilitation and habit. We are aware that some states of mind, some ideas recur more frequently than others because they have been recalled more frequently. Mental attitudes, mental processes can be repeated without effort and naturally. By repetition they have become habitual. We have seen that Stout attributes to the dispositions various degrees of excitability. Revival depends 'on the excitability of a preëxisting disposition.'[2] Lipps speaks of the 'explosive character of reproduction,' of the energy of the dispositions themselves which is released when they come in contact with other representations. A disposition would not deserve the name if it did not contribute to the final result from its own energy.[3]

[1] Ladd, *Philosophy of Mind,* p. 343.
[2] *Analytic Psychology,* pp. 23, 24.
[3] *Grundthatsachen des Seelenlebens,* p. 107.

Such expressions cannot be condemned and excluded, but it must be kept in mind that properties which are attributed to the dispositions belong properly to the subject which is disposed by them. As we cannot conceive of physical energy without a material reality, so also we cannot conceive of mental energy without a mental reality distinct from the mental processes. If a disposition can modify subsequent processes, it is in virtue of the energy of the agent.

The most evident testimony of consciousness manifests to us the unity of our mind. All our conscious states are connected, and all are referred to one and the same central subject. This also the theory of psychical dispositions is made to explain. "A mind is the unity of manifold successive and simultaneous modes of consciousness in an individual whole. But further scrutiny of the nature of the unity in which the manifold modes of consciousness are combined to form a mind, shows that this unity necessarily implies conditions which are not themselves modes of consciousness. In the very conception of an individual mind it is implied that present conscious process is throughout conditioned by prior conscious process, and this is only intelligible if we suppose that past experience leaves persistent after-effects, which continue when the corresponding consciousness has ceased. . . . The introspective psychologist finds that he can give no connected account of conscious process, without transcending the data of introspection."[1]

This solution, so far as it goes, is certainly good and must be admitted; but here again we must remark that it can itself be made acceptable only by admitting all the conditions which are necessary to make it possible. When the mind is understood as the unity of diverse conscious states 'in an individual whole,' it is true that we account for this unity by admitting the persistence of after-effects of conscious processes, and the conditioning of a process by a past one; but this in turn must be accounted for, and we have seen that it cannot be without a permanent subject. The danger is in the neglect of this condition. "Modern philosophy, both empirical and transcendental, has manifested a growing hostility toward all doctrines that may be labeled 'scholastic.'

[1] Stout, *Analytic Psychology*, pp. 1, 2, 20.

Substance in general, and soul-substance in particular, are concepts that are peculiarly and essentially scholastic, and as such they have fallen into pretty general discredit with the thinkers of this century. . . . There are . . . no end of substitutes for the old substantial soul, 'formal unities,' 'concrete totals of experience,' 'unique centers of perception and activity'; besides all sorts of 'Egos,' transcendental and otherwise; but none of these has either the virtues or the vices of the mediæval soul-substance."[1] For some writers, the psychical disposition theory replaces the old substance theory in some of its functions, and yet the former is hardly possible without the latter. It is a postulate which certainly has its justification; the interpretation of evident and undeniable facts is impossible without it. But the postulate itself must be a logical one, and we must admit all the conditions which will make it a real explanation. "Real explanation assigns definite conditions through which, by the operation of definite laws, definite results must arise. Where we cannot thus resolve a fact into its factors, such words as potentiality, faculty, susceptibility, are mere masks for our ignorance, and ought to be acknowledged as such. Now, the distinctive tendency of the faculty psychology was to treat a naked possibility as if it were something, as if, in fact, it were identical with its own realization, hidden away in some mysterious fashion."[2]

We agree entirely with Dr. Stout and admit the criticism of the faculty theory in the sense in which he understands that theory. (We will show later that it has a more acceptable meaning.) But we cannot help thinking that in the theory of psychical dispositions we are exposed to the danger of falling into the same defect which is pointed out here, and which we cannot too carefully guard ourselves against, namely, that of giving a merely verbal instead of a real explanation; that of treating dispositions as if they were real things; and that of resting content once we have given the immediate explanation of memory and habit, without examining how far this explanation itself is legitimate. This, we say, is a danger. Not,

[1] W. P. Montague, 'A Plea for Soul-substance,' *Psychol. Rev.*, 1899, p. 457.

[2] Stout, *Analytic Psychology*, pp. 18, 19.

indeed, that we blame the psychologist who does not handle the metaphysical problems concerning the nature of the mind. He does not need their solution for his experiments in the laboratory; neither in fact does he always need dispositions. But assumptions which can be dispensed with when we stand on a certain plane of investigation and consider a subject from a special point of view, may be necessary when we consider the same subject under another aspect. The psychologist, who in his explanations stops at psychical dispositions, may be justified in doing so, but he must realize that this theory itself requires conditions which cannot consistently be rejected. Another psychologist, or metaphysician if we choose to call him by that name, has the right to examine the value of the theory and to consider it from a different or higher standpoint.

The theory of psychical dispositions has enough difficulties and obscurities in itself and from its very nature; let us not make it more difficult and even impossible by denying the basis on which it must rest.

So far we have in a general way discussed the logical consistency of the theory of psychical dispositions if the mind is assumed to be nothing but the mental processes. We have used the word series in a general sense to signify the sum or succession of the mental states. We must now add a few words concerning two special views which are further determinations of the mind-series theory, and which are held by two of the most prominent psychologists of our time. This will complete the preceding considerations by bringing out more clearly a few points which have been neglected or touched upon too summarily. These two theories are Professor Ebbinghaus' 'Gesammtheit,' and Professor James' 'stream of thought.'

Ebbinghaus' Gesammtheit.

According to Professor Ebbinghaus[1] the soul is not the sum (Summe) of mental states, but what we may call their totality, collection, *assemblage, ensemble,* in so far as these words can be used to translate the German word 'Gesammtheit.' Imme-

[1] *Grundzüge der Psychologie,* §2.

diate experience tells us that our mental states are not independent and isolated, but always accompanied by other states, and thus are only members of a 'complex.' It also tells us that all these states and operations are supported by, and attributed to, a subject, the ego, which is distinct from the organism and which is immediately perceived with each idea. Changing thoughts leave the ego unchanged, and therefore are distinct from it; thus the ego manifests itself as simple, identical with itself and permanent.[1] For the plain man (für den natürlichen Menschen) such immediate experience is assumed to correspond to the reality; for him, and also for 'the theoretical psychologist,' the mind is really a substance, distinct from mental states and abiding identical under their successive changes.

The arguments in favor of a mind-substance, however, are not cogent nor convincing. They are even weaker than the arguments against it, so that the permanence and unity of the mind are really illusory.[2] How in fact a thing can be inherent in another which is its support, without being distinct from it, can be illustrated by an example. A plant is composed of various parts: roots, branches, leaves, cells, flowers, etc. All these are united and form one whole; each one is supported by the others and depends on them, but there is no subject distinct from their aggregate. The leaves belong to the 'complex' root-stem-bark-branches. . . . The roots are the roots of the 'complex' stem-bark-branches-leaves. . . . So that the subject to which every one of these is attributed is the 'complex,' not the mere sum or addition, but the 'Gesammtheit' of the others: we must take in consideration all their various conditions of relative dependence.[3]

The same holds good for the mind: it is the *Gesammtheit* of the mental states. The ego is but a complex, in the same manner as the plant or the animal. A thought which is in the foreground of consciousness is *attributed to* the ego. When another takes its place, the former becomes *a part of* the ego itself, and contributes to constitute it. Hence the self, which

[1] Pp. 9–11.
[2] Pp. 12, 13.
[3] Pp. 13–15.

at first sight appears to be unchangeable, permanent and identical, upon further reflection proves to be changeable, and no more identical with itself than the tree of the forest; it is constantly undergoing change. The soul is therefore a *Gesammtheit* of many parts, a 'system' of numerous closely united and causally related realities-of-consciousness.[1]

To the general criticism already presented we can here add a few special remarks. A metaphysician might doubt the accuracy of the description of the plant as made by Ebbinghaus. The question to be solved was this: whether besides the inherent being (Getragenes) there was a supporter (Träger), 'a special being in *the metaphysical sense.*' We are asked to go through a process of physical dissection; the various parts of the plant are taken apart and considered separately, and we find nothing else, no special substance. Quite naturally; remove all the component parts of a whole and every thing disappears, since the whole is equal to the sum of its parts. If the question was to find a substance 'in the metaphysical sense,' one should use one's reason and its power of abstraction, not the ax, the saw or the knife.

But even in a physical sense, the two cases of the plant and the soul are widely different. The plant is a complex of the parts which compose it; it is neither the stem, nor the roots, nor the leaves . . . taken separately, but the union of all these; the plant is actually a complex of those parts which it actually possesses. One would hardly be listened to if he said that the present tree, now in winter, is actually composed of the leaves or of the flowers which it produced last summer, or of the branches which were cut off some time ago. In the case of the mind, we are asked to admit that it is made up of transitory states. The appearance of one means the departure of the preceding, and as far as consciousness informs us, no trace of it is to be found. It is only by reasoning on the facts of memory

[1] "So wird hier . . . von der Seele gesprochen werden; nicht als von einem besonderen, unteilbar einfachen Wesen, sondern als von einer eigentümlich gegliederten und einheitlichen Gesammtheit, einem selbständigen System zahlreicher, eng verbundener und in vielfachen Wechselwirkungen stehender Bewusstseinsrealitäten." Pp. 15–18.

and reminiscence that we infer the persistence of some disposition. How can we say that the actual state is attributed to the ego, and that when it has disappeared, when it is past, then it becomes a part, a constitutive element of the ego itself?

Moreover it must be noticed that the parts which compose the plant are material and capable of supporting one another, of acting upon one another with the various chemical, mechanical, physical forces which they possess. Not only while it is a member of the plant-complex, but even when it is separated from it, the stem can be used as a support for other material things, as beams for a house, props for a tree, etc. Although the twig is severed from the stem, it can none the less remain the subject which supports the leaves and the blossoms. If the plant be divided into its various parts, every one of these remains a substance, capable of existence and activity. But when we speak of ideas, of presentations, of mental states, we speak of processes and functions. To make them support one another, act on one another, unite so as to form a complex, is to give them a substantiality to which they have no right. A plant also and its various organs have functions to perform. Can we say that these functions unite so as to form a complex, simply and immediately by themselves, and not rather through the union of the organs of which they are the functions? The plant is a complex of parts, not of functions. In the same manner the mind, whether it be composed of parts or not, cannot be a complex of functions. We must say rather that the mental processes are united in and through the unity of the subject whose functions they are.

Finally the questions arise: For whom and of whom is the present state of consciousness an experience? For itself, or for the ego-complex? And when the present state is recognized as similar to the past, who recognizes it? Is it the whole complex, or the present state alone? The complex is but an aggregate of states, of functions, which we cannot suppose to be acquainted with all the others individually. Moreover all are now past, since the present is not a part of, but attributed to, the ego. Shall we say then that two similar states simply happen to make a mutual acquaintance, and perceive that out

of so many states they bear to each other a special resemblance? In the mental *Gesammtheit* where are the psychical dispositions which Ebbinghaus admits? Not in the past states that constitute the ego, since they have disappeared, and the dispositions, though unconscious, remain permanently present. In the present process? Then all the above mentioned difficulties come back. Mind-series and mind-gesammtheit seem equally insufficient to receive, preserve, transmit psychical dispositions. It sometimes happens that those who despise the 'theoretical psychologists' hold themselves the most 'theoretical' views.

James' Stream of Thought.

Professor James[1] rejects the conception of the mind as a series of 'substantive psychoses, sensations and their copies and derivatives, juxtaposed like dominoes in a game, but really separate.'[2] The theories of Hume, maintaining that the self is nothing but a bundle or collection of successive perceptions; of Taine, for whom the ego is a continuous web of conscious events; of John Stuart Mill, with his series of feelings aware of itself as a series, and his inexplicable tie which connects the present consciousness with the past; these theories are shown by James to be utterly unintelligible, devoid of consistency and opposed to facts.[3] The refutation is presented with that strength, interest and fascinating exposition which characterize the *Principles of Psychology*.

With no less vigor and animus is the spiritualistic theory of a substantial soul rejected. The final conclusion is that the soul 'explains nothing and guarantees nothing'; it is superfluous 'for scientific purposes.' "It is at all events needless for expressing the actual subjective phenomena of consciousness as they appear." These facts are formulated "without its aid by the supposition of a stream of thoughts, each substantially different from the rest, but cognitive of the rest, and 'appropriative' of each other's content."[4]

[1] *Principles of Psychology,* Vol. I., ch. IX.
[2] P. 245.
[3] P. 350 ff.
[4] Pp. 342 ff., 344, 350.

James' theory can be briefly summarized as follows:

Consciousness is not a series, but a stream; thought is 'sensibly continuous, without breach, crack or division.' It is not 'chopped up in bits . . . it is nothing jointed; it flows.' It is not however an even and smooth stream. Sometimes the rate is slow, and then 'we are aware of the object of our thought in a comparatively restful and stable way.' Sometimes the rate is rapid, and then 'we are aware of a passage, a relation, a transition from it or between it and something else.' We can call the 'resting places' the 'substantive parts,' and the 'places of flight' the 'transitive parts' of the stream of thought. "It then appears that the main end of our thinking is at all times the attainment of some other substantive part . . . ; and the main use of the transitive parts is to lead us from one substantive conclusion to another."[1]

"The I is a thought at each moment different from that of the last moment, but appropriative of the latter, together with all that the latter called its own." The ego is therefore nothing but the 'real, present, onlooking, remembering, judging thought, or identifying section of the stream.' The 'title' of a collective self is passed from one thought to another, so that 'each thought is thus born an owner and dies owned, transmitting whatever it realized as its self to its own later proprietor.' In a word, the whole problem of our mental life is solved by the assumption of the present thought appropriative of the past.[2]

With regard to this theory, a few remarks must be made. The term itself 'stream of thought,' however great be its merits and superiority over other expressions, if it be proposed as an adequate rendering of reality, is open to several objections. A stream necessarily implies a source from which it derives its supply of water; when we apply this term to the mind we have not given an account of mental life until we have indicated its origin. Professor Ladd goes so far as to call the expression 'stream,' as applied to the mind, 'a complete misuse of the figure of speech,' because "a stream implies permanent banks

[1] Cf. esp. pp. 239, 243.

[2] Cf. esp. pp. 338 ff., 400 ff.

that, really existing, give direction to and make possible the existence of the stream. Moreover every stream exists as an actual succession of simultaneously existing parts; it exists all at once as a stream consisting of sections with varying depths and different disturbances of the surface throughout its entire length." But in the so-called stream of consciousness, "each section, each wave, comes into being only as the next preceding ceases to be; so too did that next preceding one come into its being; so will the next and yet the next succeeding wave begin to be. Where then shall we find, no matter how closely we search, any reality answering to this fiction of a permanent subject of changing states,—that is, of a real being, for the mind; something more than, or over and above, the passing being, in ceaseless succession, of the conscious states?"[1]

James acknowledges that the question whether there are interruptions of consciousness in sleep, epilepsy, etc., cannot be answered with certainty, and that 'on the whole it is best to abstain from a conclusion.'[2] If there are such interruptions, what becomes of the stream? James answers that we mentally 'reach back and make connection' with our own stream of thought. After sleep, 'the past thought of Peter is appropriated by the present Peter alone.' He remembers his own states; his present thought appropriates and owns them all, and 'this community of self is what the time-gap cannot break in twain, and is why a present thought, although not ignorant of the time-gap, can still regard itself as continuous with certain chosen portions of the past.'[3] But we ask: How then is such a transmission possible? How can the first thought of the awaking man at once take possession of a thought which was present several hours earlier, but has since entirely vanished? The present thought cannot appropriate it unless it first revives it, and how is the revival out of nothingness possible? Something able to exist by itself must have remained to link the two interrupted sections of the stream.

Even if we granted that the stream of thought is uninter-

[1] *Philosophy of Mind,* pp. 91, 92.
[2] P. 199 ff.
[3] P. 239.

rupted, the 'appropriation' by the 'present thought' of all past mental experience, the 'transmission of title' remains very obscure. We can imagine, it is true, 'a long succession of herdsmen coming rapidly into possession of the same cattle by transmission of an original title by bequest';[1] but we can hardly imagine that the title of a collective self 'is passed from one thought to another in some analogous way.' The herdsmen and the cattle coexist; the cattle are permanent objects, distinct from their owners; they really exist when they are transmitted; they are things that can be owned; and the herdsman is a person who can own them. On the contrary, states of consciousness are functions, transient, successive. To speak of them as 'substantive parts,' as 'substantial,' and as 'substances' (*e. g.*, p. 345) is to use metaphors which perhaps more than one psychologist would find objectionable. The possessor and the possessed object never coexist, and a 'segment' of the stream begins to be owned only when it ceases to exist as a conscious state.

What is the nature of the appropriated state? We cannot say that it is mental, and yet unconscious, because James denies the existence of mental unconscious states.[2] The past states are appropriated as 'faint' states. "They are eternally as they feel when they exist, and can neither actually nor potentially be identified with anything else than their own faint selves. . . . It is the destiny of thought that on the whole our early ideas are superseded by later ones, giving fuller accounts of the same realities. But none the less do the earlier and the later ideas preserve their own several substantive identities, as so many several successive states of mind."[3] What are those faint selves preserving their identity? Conscious states of mind? Then how is it that we are not aware of their presence? Unconscious states of mind? This also is impossible, according to James. Further determinations and explanations are wanted. Moreover, as remarked above, shall emotions, cognitions, volitions, with their numberless varieties, include one another?

[1] P. 339.
[2] P. 162 ff.
[3] P. 174.

How my present emotion of fear or anger actually owns, includes, appropriates my geometrical or algebraic demonstration of years ago is more than obscure. This seems the more impossible for James who is so stanch an advocate of the simplicity of our mental states. Does the present contain all the past and yet remain a simple, indivisible state? "No possible number of entities (call them as you like, whether forces, material particles, or mental elements) can sum themselves together. Each remains in the sum what it always was; and the sum itself exists only *for a bystander* who happens to overlook the units, and to apprehend the sum as such."[1] Who is that bystander distinct from the mental units?

James himself in another place[2] seems to forget his accumulation of the whole past by the present thought. "The knowledge of some other part of the stream, past or future, near or remote, is always mixed in with our knowledge of the present thing." Successive thoughts ought to be represented as

A B C D E F G
B C D E F G H
C D E F G H I etc.

"the lingerings of the past dropping successively away, and the incomings of the future making up the loss." If all experiences are included in the present thought, why not include *A* in the second thought, and *A B* in the third? Why speak now of a 'dropping away,' of a 'loss,' since past ideas preserve their 'own several substantive identities'?

And by what magic power is the faint, weak idea now and then aroused in consciousness? How does it acquire the habit of reappearing? How is it recognized? The 'judging thought,' owner of the past, must refer its own appropriated states to other states in the past, know the similarity between the two. All this is arbitrary, to say the least, if there is nothing permanent under the present and the past thoughts.

In brief, to formulate all the facts by the supposition of a

[1] P. 158.
[2] P. 606.

stream of thought seems impossible. 'The passing thought itself is the only verifiable thinker,' says James,[1] and hence the substantial soul is to be rejected. Yes, the passing thought alone is verifiable; to make it appropriate the past, own preceding faint states and selves, transmit its titles to its successor, be born an owner, and die owned, etc., all this is not verifiable; it can neither be proved empirically nor shown to be a sufficient explanation of the facts.

Conclusion of the Preceding Arguments.

From what precedes, we can now summarize the following conclusions. Psychical dispositions require something besides a series of mental phenomena, in whatever manner it be proposed. Professor Baldwin testifies to this logical necessity when he says of the theory of psychical dispositions that it is 'more philosophical' than the theory of a storing up of images, and that 'if we were able at this point to make the assumption of a substance called mind . . . we would be justified in resting in the law of habit in respect to it, as we are in resting in the physiological law of habit.'[2] Psychical dispositions require a subject which can be disposed by them, and of which they are modifications. Recognition requires a permanent being, a judge, a witness of the past and of the present, able to know their similarity, analogy, difference. Facilitation requires an active principle whose necessary effort toward a given operation is diminished by repeated exercise, and whose energy can be given a special direction. The unity of the mind is more than the uninterrupted stream of thought. We need a substantial being which can own, be proprietor, look for its stray possessions, search for its forgotten ideas, refer and attribute to itself as its own the various states and activities by which it manifests its existence. For this reality is perceived only when acting, and known through its operations. In this sense, Descartes' 'Cogito ergo sum' must be accepted; we do not know an empty, idle soul; we perceive it only by its actual operations. In the same manner we do not know a disposition

[1] P. 346.

[2] *Senses and Intellect,* p. 155.

in itself, but only in its effects. St. Thomas also makes the same remark: 'In hoc enim aliquis percipit se animam habere, et vivere, et esse, quod percipit se sentire, et intelligere, et alia huiusmodi vitæ opera exercere.'[1]

The same principles which lead us to postulate psychical dispositions lead us also to postulate a soul; the former do not seem possible without the latter. If in the brain series we assume some reality underlying the cerebral processes and dispositions, we must also assume under the mental processes a mental reality. Psychical dispositions are necessary to explain certain facts, but they themselves must rest on something else. A substantial mind does not make the nature of the dispositions known to us, but it gives them a support without which they could not stand. A disposition is not merely a connecting link between processes; it has a deeper significance. If it unites processes, it is because it affects the one agent from which they proceed.

Briefly, we cannot take the term psychical disposition which is used by modern writers, as a mere verbal explanation, an empty word meaning nothing real, and expressing simply an abstraction. Such a use is to be banished from a serious treatment of the facts. There has been enough abuse of words, and modern thinkers are right in waging war against it. We do not want to rest satisfied with names and abstractions when we have real facts to explain. It is also impossible to use the term psychical dispositions as meaning organic dispositions in so far as these would be the cause of conscious states. This would be nothing but materialism, the mind becoming a function of the organism. Moreover those who admit psychical dispositions oppose them to physiological dispositions, in the same manner as they admit the irreducibility of the mental to the physical series. Consequently psychical dispositions must mean real dispositions in the mind, and then a view of the mind has to be admitted which will be consistent with the theory of dispositions.

[1] Quæst. disputatæ, De Veritate, q. X., art. VIII. This is but an echo of Aristotle: "'Ο δ' ὁρῶν ὅτι ὁρᾷ αἰσθάνεται καὶ ὁ ἀκούων ὅτι ἀκούει . . . αἰσθανοίμεθα ἂν ὅτι αἰσθανόμεθα· καὶ νοοῖμεν ὅτι νοοῦμεν· τὸ δ' ὅτι αἰσθανόμεθα ἢ νοοῦμεν, ὅτι ἐσμέν." *Ethic. ad Nichom.*, l. IX., c. IX., 1170a, 29.

Parallelism. Psychophysical Identity.

We have said in the beginning of this chapter that psychophysical parallelism and the identity theory were frequently admitted by modern psychologists as further determinations of their views concerning the mental series. We will not attempt to discuss the value of these theories, but we must make a few remarks which pertain to the present subject.

In the theory of parallelism it seems evident that psychical dispositions are absolutely necessary. Organic traces cannot be assumed as explanations of the facts of memory and mental habit. What efficacy can such traces have toward the reproduction of a mental process? They belong exclusively to the physical series; and as the physical can never come in touch with the mental series, they cannot account for facts belonging to the mind. Each series is complete in itself and parallel with the other, but independent of it; it would proceed in the same manner even if the other were not there. Each series consequently must have in itself, and cannot find in the other, the reason of its successive processes and of their relations. No brain disposition will account for conscious memory. How then can a parallelist consistently base his theory of memory and of the various relations of the mental processes on the law of physiological habit?

But if the psychical dispositions are needed, we must remember that the parallelism as it is presented is somewhat defective, and this on an important point. On one side we have simply mental processes without any substantial mind; on the other we have physiological processes of what we always conceive as a material substratum, *i. e.*, processes of the brain. This difference is sufficient to break the parallelism by making the existence of psychical dispositions impossible.

Granting that they could exist, the term parallelism—objectionable already for other reasons, for how can we call parallel two series of utterly different nature?—would not be a satisfactory expression of the facts. Not all brain process is correlated with a conscious process, and as a consequence not all brain disposition has a corresponding mental disposition. All

the parts of the brain have functions and acquire dispositions. But only processes of the brain cortex are supposed to have parallel conscious processes; and processes in the brain cortex can be determined by dispositions left in other parts of the brain with which it is related. To these no mental disposition corresponds; yet some mental disposition, not parallel to the organic disposition, is needed to explain the mental series.

Another objection is that the physical series is mechanical; efficient causes suffice to determine its course. The only effect of a disposition is to modify a certain organ or part of an organ, so as to prepare it to receive the action of these causes. The mental series is teleological; it derives an impulse from the end, the purpose one has in view. The psychical disposition enables the mind to turn toward the past by memory in order to find therein new motives for future action; it prepares future effects not always directly, but sometimes indirectly through the consciousness of the past.

That in certain cases and for certain investigations parallelism may be useful as a 'working hypothesis' no one will deny. But it is equally clear that it does nothing but formulate the facts, without offering any explanation of them. It is not a solution, and even frequently its working will be found deficient. Unless we deny that words are intentionally used to express ideas; that the bodily gestures and attitudes of others manifest the existence of their mind, and to a certain extent the nature of the conscious processes which they experience; that certain conscious states, especially pleasure and pain, are factors in the organic evolution of the individual and of the race; that there is a moral law, and that men are responsible for their actions, etc.,—unless we reject all this, we must admit that parallelism, even as a working hypothesis, has a limited field of application.

The identity or double-aspect theory is presented as a complement of parallelism, as the final interpretation of the facts formulated by it. Both series are parallel because they are two different manifestations of the same substance. There is only one reality with two aspects: the exterior or physical, and the interior or mental. This, however, does not remove the diffi-

culty. Each series must be accounted for independently of the other, and we must admit conditions which will enable each series to preserve dispositions. The absolute disparity and irreducibility of the physical and of the mental series have been emphasized especially by parallelists and monists. The two series are 'on utterly different platforms'; they 'have very little in common'; their difference 'transcends all other differences.' The term itself parallelism or double-aspect denotes that no meeting is possible.

And yet they do meet in a certain sense, if not during their course, at least in their starting-point, since both originate from the same substance. They have something in common, since they are appearances of the same reality. Parallel processes, which are of too different a nature to act on each other and exercise a mutual influence even in the slightest degree, can nevertheless be reduced to aspects of the same reality.

It is also a little strange that both aspects should be known to one of them only. The mind alone knows both the conscious processes as the interior side, and the material processes as the exterior side of reality. I understand that two parallel faces of a cube may be different in appearance; one may be white and the other black, and both may have their own individual qualities. The same curve may be looked at from within or from without, and it will present two aspects, one concave, the other convex. The same fact can be expressed in two different languages. In these comparisons frequently used by monists there is a general defect. One of the two languages does not express the same fact for the other, and the man who understands only one language will have only one expression of the fact. The two faces of the cube or the two aspects of the curve are knowable only to a third consciousness which can pass from one side to the other, compare the two, perceive their difference, change its own position so as to take successively two points of view. Suppose the white surface of the cube and the view of the curve from the interior to represent consciousness, they will never come to know anything of the black surface or of the convex appearance of the one reality.

In the identity theory the one reality manifests itself in two

ways; but both are aspects only for one, for the interior, the conscious aspect. How is it possible for the mind to be aware of both its own and the other, the material process with which it can have now no point of contact? In order to know it at all must it not first reach and meet it? And if we give the mind that special prerogative, we make it more than an aspect or appearance, more than a series of processes.

Then how many questions arise. Does the double-aspect extend to all beings? Shall we like Paulsen admit an *Allbeseelung;* what signs of it have we? Or is the mental aspect limited to some beings, as Bain and Spencer claim? Then where does it begin, and how is it that it appears at all? Within the same being, how is it that only some brain processes have a corresponding mental process?

But to confine ourselves to our subject, what is a psychical disposition? The same disposition must be physical or psychical according to the point of view one takes of it. "As conscious process in general is correlated with nervous process, so psychological traces and dispositions may be regarded from another point of view as physiological facts. They are persistent modifications of nervous structure. Their existence, interconnection and mode of operation are in the first instance revealed to us by purely psychological evidence. But there are many advantages in also considering them from a physiological point of view."[1] "For the sake of clearness it is very often necessary to separate unambiguously the purely psychological evidence concerning the interconnection and mode of operation of residual traces from corresponding physiological data and hypotheses. When and so far as this is the case, it is best simply to use the term 'psychical disposition' without any physiological reference. When on the other hand we desire to consider exclusively the physiological side, the term 'physiological disposition' is in place. When both are simultaneously to be taken into account, it is appropriate to speak of a 'psycho-physical disposition.' Only by such a nomenclature as this is it possible to avoid clumsy circumlocution and artificial attempts to state from

[1] Stout, *Manual of Psychology,* p. 102.

one point of view what can only be satisfactorily stated from a different point of view."[1]

Monism, as Professor Pringle-Pattison remarks,[2] "while professing to harmonize materialism and spiritualism, occupies a position of somewhat unstable equilibrium between the two, and shows a tendency in different expositors to relapse into the one or the other." The one substance may be conceived as matter —and mind reduced to it; or as mind—to which matter is reduced; or as some third unknown reality. It is clear that to speak in the first hypothesis of psychical dispositions, and in the second of organic dispositions, may perhaps be a useful terminology, but nothing else; the words denote nothing real. If matter and mind are only manifestations of some reality different from both, can the monist speak of psychical dispositions? That he can speak of physical and of conscious *processes* is evident; but psychical dispositions are not conscious. Are they nevertheless the other side of what we know as physical dispositions? If the same process can be viewed from within and from without, it is more difficult to apply this to the disposition. We can hope, says Wundt, to understand later that which is obscure now in the physical order; but we have no such hope for psychical dispositions, because the limits of consciousness are also the limits of our inner experience.

If neither matter nor mind are substances, but only phenomena, dispositions can be in neither series. Stout himself speaks of the dispositions as modifications of nervous structure, and of 'brain substance.' This is the only way according to which we can consistently think of them. They are in a substance, and the same applies to mental dispositions also.

3. Psychical Dispositions in the Mind Substance Theory.

Descartes. Interaction.

According to Descartes, man is essentially a soul, a simple, spiritual being, the essence of which is thought.[3] The body

[1] Stout, *Analytic Psychology*, p. 23.

[2] In Baldwin's *Dictionary of Philosophy and Psychology*, s. v. 'Double Aspect Theory.'

[3] "Sum igitur tantum præcise res cogitans, id est, mens, sive animus, sive

is but a 'machine,' or a 'statue,' and is compared to 'clocks, artificial fountains and other similar mechanisms.' All its functions are purely mechanical.[1]

In this Descartes opened the way to what has been called more recently the automaton-theory. But in Descartes it is not absolute; only in a certain number of its movements does the body act as a pure mechanism. The will, faculty of the spiritual soul, has a certain control of the body and can produce motions in it or check natural impulses.[2] For there is, notwithstanding the absolute disparity in nature of body and soul, an interaction between them. The 'animal spirits' communicate to the soul located in the pineal gland various impressions which produce in it thoughts or ideas; and they transmit to the organism the commands of the soul. We have already reviewed this theory as far as it is used to explain memory and habit. We have seen that Descartes admits two kinds of memory, one depending on traces left in the organism, the other spiritual, depending on the soul alone and accounted for by traces left in 'thought itself,' the nature of which cannot be explained.

The difficulty of the theory in both cases is apparent. It is difficult to see how a spiritual substance, the whole essence of which is actual thought, can preserve impressions in an unconscious form. "Cogitationis nomine intelligo illa omnia quæ nobis consciis in nobis fiunt, *quatenus eorum in nobis conscientia est.*"[3] Thought, therefore, being what we are immediately

intellectus, sive ratio. . . . Sed quid igitur sum? res cogitans; quid est hoc? nempe dubitans, intelligens, affirmans, negans, volens, nolens, imaginans quoque et sentiens." *Meditat.*, II.

In another place he adds: "Hæcque optima via est ad mentis naturam, eiusque a corpore distinctionem agnoscendam: Examinantes enim quinam simus nos . . . perspicue videmus nullam extensionem, nec figuram, nec motum localem, nec quid simile, quod corpori sit tribuendum, ad naturam nostram pertinere, sed cogitationem solam." *Principia philosophiæ*, P. I., No. VIII.

[1] "Je désire que vous considériez que ces fonctions suivent toutes naturellement en cette machine, de la seule disposition de ses organes, ni plus ni moins que font les mouvements d'une horloge ou autre automate, de celle de ses contrepoids et de ses roues." *De l'homme.*, ed. Cousin, Vol. IV., p. 347 ff.; cf. 427, 428.

[2] "Etiamsi nulla in eo mens existeret, eosdem tamen (corpus) haberet omnes motus qui nunc in eo non ab imperio voluntatis, nec proinde a mente procedunt." *Medit.*, VI.

[3] *Principia Philos.*, I., IX.

conscious of, and the soul being essentially thought, how can we say that there are in the soul traces which are unconscious? How can we find something that really belongs to the soul, and yet is unperceived and unconscious?

The theory of organic traces is subject to the general difficulty of an interaction between a spiritual and a material substance. It is impossible to understand how a spirit can come into contact with an extended substance so as to move it. Nor can we understand how a certain movement in the organism can act on the spirit so as to produce a conscious state. This is one of the objections urged against the theory of Descartes and his followers, the interactionists. Occasionalism, preëstablished harmony, with their modern successor, parallelism, are attempts to explain the relations of mind and body without admitting any interaction.

Malebranche and Leibniz.

Both Malebranche and Leibniz deny the interaction of soul and body. According to the former, God Himself, on the occasion of a movement in the organism, produces in every instance a corresponding impression in the soul, and *vice versa.* No natural causes are true causes; they act only by the force and efficacy of the will of God.[1] "The alliance of body and soul, as far as we can know, consists in a natural and mutual correspondence of the thoughts of the soul with the traces in the brain, and of the emotions of the soul with the motions of the spirits."[2]

According to Leibniz, body and soul are like two clocks that are made in such a way as to keep exactly the same time. Each is given by God from the beginning a first impulse and motion from which all following actions necessarily result. As God gives to both body and soul such an initial movement from which he foresees that all subsequent actions will be in perfect harmony, it follows that organic processes and mental states will always take place in strict correspondence.[3] It is worthy

[1] *Recherche de la vérité,* L. VI., P. II., ch. 3.

[2] *Ibid.,* L. II., ch. V., §1. Cf. *Entretiens sur la métaphysique,* 7e Entretien, II.

[3] *Système nouveau sur la communication des substances,* 14 ff., Monadologie, 7.

of remark that Leibniz bases his criticism of Descartes on a principle which resembles very closely the principle of the conservation of energy, which is so frequently adduced to-day against the theory of interaction and the theory of free will.[1]

The theories of occasionalism and preëstablished harmony need not be discussed here. In so far as they affirm a coincidence of events they are, like modern parallelism, simply a statement of the facts. The explanation which they offer is the denial of the facts to be explained, *i. e.*, the relations of mind and body. To have recourse to God is beyond the range of the philosophical sciences and against the testimony of consciousness.

Aristotelian and Scholastic Theory.

1. *Unity of Man and Duality of His Constitutive Principles.*—Descartes' psychology was a complete departure from the theories that had been accepted before his time. His splitting of man into a thinking soul and a mechanical organism; his opposition of mind and matter, which was made after him an irreconcilable antagonism; this was an innovation and a breaking away from the traditional views hitherto held. For the schoolmen following Aristotle, what consciousness manifests to us in the first place, what we are directly aware of, is not the duality of man, but his unity. Man is one, and feels that he is one; conscious states are his, organic processes are no less his. Man's arm is moved, man's eyes perceive colors, man's intellect perceives the abstract reasons of things. Man is the undivided subject not only of the higher mental operations, not only of the processes of sensitive knowledge, but even of the lowest functions of the organism. This substantial unity is the fundamental view of man.

But man is not a simple substance. As all material beings are composed of matter and form, so also man is a 'compos-

[1] "Descartes a reconnu que les âmes ne peuvent point donner de la force aux corps, par ce qu'il y a toujours la même quantité de force dans la matière. Cependant il a cru que l'âme pouvait changer la direction des corps. Mais c'est parce qu'on n'a point su de son temps la loi de la nature qui porte encore la conservation de la même direction totale dans la matière. S'il l'avait remarquée, il serait tombé dans mon système de l'harmonie préétablie." *Monadologie,* n. 80.

itum' of two principles, incomplete in themselves, which stand in mutual need of each other. Body and soul, united as matter and form in one complete essence of man, are the principles of the various properties and activities of the human 'compositum.' They give us the reason of the double series which we observe in man. They act not so much on each other as together; their combined action is one because it flows from a substance which is really one; their union does not consist in their reciprocal activity, but in their perfect communication. St. Thomas positively rejects interaction in the Cartesian sense: "Incorporeum non potest immutari a corporeo. . . . Nihil corporeum imprimere potest in rem incorpoream."[1] Hence there are operations which are performed by body-and-soul united in one common principle of action. This would be impossible if they were two distinct substances. Two individuals can coöperate; they can unite their efforts to produce an effect which each by himself is incapable of causing. In such a case the action may be called one if we consider the end to which it tends; but it is twofold if we consider the principles from which it proceeds.[2] If man is conscious of the unity of his action, it is because he is really one principle of action, one complete substance.

To develop at greater length the preceding doctrine is neither necessary for our purpose, nor possible within the limits of

[1] *Summa theol.*, P. I., quæstio 84, art. 6

We shall quote only two passages from St. Thomas to show how man's substantial unity was conceived. "Non enim corpus et anima sunt duae substantiae actu existentes, sed ex eis duobus fit una substantia actu existens; corpus enim hominis non est idem actu præsente anima et absente, sed anima facit ipsum actu esse." *Contra Gent.*, l. II., c. 69.

"Ex anima et corpore constituitur in unoquoque nostrum duplex unitas, naturæ et personæ. Naturæ quidem secundum quod anima unitur corpori formaliter perficiens ipsum, ut ex duobus fiat natura, sicut ex actu et potentia, vel materia et forma. . . . Unitas vero personæ constituitur ex eis quantum est unus aliquis subsistens in carne et anima." *Summa theol.*, P. III., quæst. 2, art. 1, ad 2.

[2] "Impossibile est quod eorum quæ sunt diversa secundum esse, sit operatio una; dico autem operationem unam, non ex parte eius in quod terminatur actio, sed secundum quod egreditur ab agente; multi enim trahentes navim, unam actionem faciunt ex parte operati quod est unum; sed tamen ex parte trahentium sunt multæ actiones quia sunt diversi impulsus ad trahendum. Cum enim actio consequatur formam et virtutem, oportet quorum sunt diversæ formæ et virtutes, et actiones esse diversas." *Contra Gent.*, II., c. 57.

the present work, as it would include the study of the whole theory of matter and form or hylemorphism. We simply remark that the unity of man is a most direct experience and a primary fact of consciousness. Hence the essence of the soul is not actual thought, but it is to be the "substantial form" of the human body, according to the classical definition of Aristotle: "εἶδος or ἐντελέχεια ἡ πρώτη σώματος φυσικοῦ δυνάμει ζωὴν ἔχοντος."[1]

2. *Faculties.*—In man the soul, like the 'forma substantialis' in all material beings, is the principle of activity,[2] and its energy is spent through several channels or faculties. The faculties are not merely groups of operations, or general terms which we use for a purpose of classification, but they are various modes of energy. The opponents of the faculty theory have represented them as distinct entities, as powers independent of the soul and of one another, as 'hypostasized possibilities,' and it was an easy task to refute this conception. But such has never been the faculty theory as presented by the scholastics. A faculty is but a mode according to which the soul acts; it is like a channel conveying the soul's energy in various directions. The source itself of energy is one and the same. It is not the faculty that acts, but the soul that acts through the faculty, as the architect in building makes use of his knowledge, "Operantur virtute animæ." They are not 'essential parts' of the soul, but 'potential parts' because the soul possesses a manifold energy.[3] That which performs acts of intellection is not so much the intellect as the soul through the intellect: "Intelligere proprie loquendo non est intellectus, sed animæ per intellectum."[4] That which is free is not so much the will as man himself. Locke lays great stress on this point, but the schoolmen before him had understood the question in the same way, and do not fall under his criticism. In

[1] *De anima,* l. II., c. 1, 412a, 20 and 27.

[2] Cf. Aristotle, *De anima,* II., c. IV., 415b, 8 ff.

[3] "Potentia nihil aliud est quam principium operationis alicuius, sive sit actio, sive sit passio; non quidem principium quod est subiectum agens aut patiens; sed id quo agens agit, aut patiens patitur; sicut ars ædificativa est potentia in ædificatore qui per eam ædificat." *Quæst. disp. De anima,* q. XII. Cf. *Summa theol.,* P. I., quæst, 77, art. 1.

[4] *Quæst. disp. De veritate,* q. X., art. 9, ad 3.

the four places where St. Thomas treats of the subject ex professo, the fundamental questions are always referred to *man:* Utrum *homo* sit liberi arbitrii? Utrum *homo* ex necessitate eligat vel libere? Utrum *homo* habeat liberam electionem actuum aut ex necessitate eligat?[1]

The faculties are also compared to the various offices which are a participation of one and the same royal power in the administration of the kingdom, *e. g.,* the bailiff would have no authority if he did not hold it from the king.[2] When therefore St. Thomas teaches that the faculties are really distinct from the soul and from one another, nothing more is meant than this. The water springing from one and the same source can run into several channels really distinct from the source and from one another. It can run in several directions and be used for several purposes. The direction of a stream, although inseparable from it, is nevertheless distinct from it and can be altered. It is true that the direction or the swiftness of a current cannot exist without the current, nor the current without a certain direction and rapidity; but this, according to the schoolmen, is no sufficient reason to identify as one and the same thing the stream and the modes according to which it flows. Similarly the source of all energy and activity in man is the soul; but this energy is spent in several directions, through different 'potentiæ.' These are distinct from each other and from the soul itself, although neither the soul can exist without faculties nor the faculties without the soul.

The faculties are divided into two great general groups, not according to their 'principle,' which in all cases is the soul from which they all derive their energy, but according to their 'subject.' Some are organic and others are inorganic or spiritual. In all the actions of the body the soul coöperates; but the soul has operations of its own which it does not share with the body.

To the organic faculties belong not only the 'vegetative'

[1] *Summa theol.,* P. I., q. 83, art. 1; Ia IIæ, q. 13, art. 6; *Quæst. disp. De veritate,* quæst. 24, art. 1; *De malo,* quæst. 6.

[2] "Potentiæ animæ dicuntur partes non essentiæ animæ, sed totalis virtutis eius; sicut si diceretur quod potentia ballivi est pars totius potestatis regiæ." *Quæst. disp. De spiritualibus creaturis,* art. XI., ad 19.

faculties, which contribute to the development of the organism, but also all sensations, internal and external, all sense-products, as imagination and memory. These do not belong to the soul alone, but to the 'compositum.' The nerve is not a mere means of transmission of an external impression to a soul located in a special part of the brain; sensitive perception is the function of the animated organ. Although our sensations are simple and indivisible, yet it cannot be denied that, at least in some cases, they have a character of extension and divisibility; this is clearly felt in the tactile sensations. Such characters are explained by admitting that the subject of sensation is neither the body alone, nor the soul alone, but the 'compositum' of both. Hence, 'there is no sensation in beings that have no soul.' But sensation belongs neither to the body nor to the soul alone. Both sensation and memory are mentioned as being 'common to the soul and to the body.'[1]

A multitude of passages could be quoted from the scholastics, showing that they held the same views. "The *principle* of the sensitive faculties is *the soul,* but their *subject* is *the compositum.*" Sensation is a function of bodily organs which derive their power from their union with the soul.[2] Memory is called 'the act of some organ.'[3] The reason of all this has been given already, that nothing material can act on that which is immaterial. Thus there is no need of a bridge between the organism and the soul; no need of asking the insoluble question: How can a material stimulation determine a conscious perception in a spiritual mind?

The intellectual faculties on the contrary are inorganic and spiritual in themselves. Their object is the universal, the

[1] Aristotle, *De anima,* II., ch. 4, 415b, 25. *De somno et vigilia,* ch. 1, 454a, 7. *De sensu et sens,* ch. 1, 436a, 7.

[2] "Manifestum est quod nulla operatio partis sensitivæ potest esse animæ tantum ut operetur, sed est compositi per animam. . . . Compositum igitur est videns et audiens et omnia sentiens, sed per animam. . . . Potentiæ partis sensitivæ sunt in composito sicut in subiecto; sed sunt ab anima sicut a principio." *Quæst. disp. De anima,* art. 19.

"Quædam operationes sunt animæ quæ exercentur per organa corporalia, sicut visio per oculum, auditus per aurem . . ., et ideo sunt in coniuncto sicut in subiecto, et non in anima sola." *Summa theol.,* P.I., quæst. 77, art. 5.

[3] *Summa theol.,* P. I., quæst. 79, art. 6, ad 1.

abstract, the moral, etc., which do not exist as such in nature, and consequently cannot act on a material faculty. "It is not reasonable, says Aristotle, to hold that the intelligence is mixed with the body . . . for it would have some organ, as sensibility, but there is none." Indeed, 'sensibility does not exist without the body, but the intellect is separate from it.'[1] It is needless to insist that this was also the scholastic teaching; we find numerous passages telling us that 'the act of intellection cannot be the act of the body.'[2]

But the intellect depends on the senses which furnish it with the materials on which it can work. 'The soul never thinks without phantasms,' and 'the phantasy is but a weak sensation.'[3] St. Thomas in many places teaches the same doctrine of the dependence of the intellect on imagination and on sensation. Hence it is that disturbances of the imagination or of the memory necessarily affect the intelligence although it is in itself a spiritual faculty.[4]

Not only for the acquisition of intellectual ideas are the senses necessary, but even for the exercise of the intellectual memory. "Ἡ δὲ μνήμη καὶ ἡ τῶν νοητῶν οὐκ ἄνευ φαντάσματος ἐστιν."[5] We have seen in our second chapter that, according to St. Thomas, the intellect can preserve the 'species intelligibiles' *in habitu.* But it needs some sensuous image to recall them *actu,* to revive them. The rule is general that the intellect has no actual knowledge without using some image, 'nisi convertendo se ad phantasmata,' and it holds even for the revival of ideas which have been acquired previously. (This image or phantasm, however, is not necessarily the image corresponding to the idea itself; it is any image that can suggest the idea.) The proof given is empirical, based on the fact

[1] *De anima,* III., c. 4, 429a, 24 ff.

[2] *Summa theologica,* P. I., quæst. 50, art. 1.

[3] Aristotle, *De mem. et rem,* c. 1, 449b, 31. Cf. *De anima,* III., c. 3, *passim. Rhetor,* I., 11, 1370a, 28.

[4] "Intellectus ex necessitate accipit ab inferioribus viribus apprehensivis; unde turbata vi imaginativa, vel cogitativa, vel memorativa, ex necessitate turbatur actio intellectus." *Summa theol.,* P. I., quæst. 115, art. 4. Cf. quæst. 75, art. 2, ad 3; quæst. 84, art. 7; Ia IIæ quæst. 51, art. 1.

[5] Aristotle, *De mem. et rem.,* c. 1, 450a, 12.

that when the senses are not in their normal condition, intellectual memory itself is disturbed.'[1]

These quotations indicate sufficiently what judgment we must pass on Bain's assertion, that 'the dependence of purely intellectual operations, as memory, upon the material processes, has been reluctantly admitted by the partisans of an immaterial principle; an admission incompatible with the isolation of the intellect in Aristotle and Aquinas.'[2]

Because all the faculties proceed from one and the same soul and derive their energy from the same source, it follows that they influence one another; the exercise of one may either cause or prevent the exercise of the others. As the energy of the soul is limited, if the operation is too intense it prevents the exercise of another activity. "Una operatio cum fuerit intensa impedit aliam, quod nullo modo contingeret nisi principium actionum esset per essentiam unum."[3] Owing to the intimate union of body and soul, and of the unity of the principle of energy in man, we understand that there must be the closest relation between bodily and mental states, since the function of one faculty can modify that of another. Mental states affect the blood circulation and consequently the heat of the organism. They can produce health and disease and even death. Insanity and other abnormal states of mind depend on the organic conditions.[4]

[1] "Manifestum est quod ad hoc quod intellectus actu intelligat, non solum accipiendo scientiam de novo, sed etiam utendo scientia iam acquisita, requiritur actus imaginationis et cæterarum virtutum. Videmus enim quod impedito actu virtutis imaginativæ per læsionem organi, ut in phreneticis, et similiter impedito actu memorativæ virtutis, ut in lethargicis, impeditur homo ab intelligendo in actu etiam ea quorum scientiam præaccepit." *Summa theol.*, P. I., quæst. 84, art. 7. Cf. IIa IIæ quæst. 49, art. 1, ad 2. *Quæst. disp. De veritate*, quæst. X., art. 2, ad 7.

[2] *Mind and Body*, p. 130.

[3] *Summa theol.*, P. I., q. 76, art. 3. On the subordination of the faculties; cf. *ibid.*, q. 77, art. 4.

[4] This reciprocal influence is described in the following passage. "Sciendum est quod secundum naturæ ordinem, propter colligantiam virium animæ in una essentia, et animæ et corporis in uno esse compositi, vires superiores et inferiores, et etiam corpus, invicem in se effluunt quod in aliquo eorum superabundat; et inde est quod ex apprehensione animæ transmutatur corpus secundum calorem et frigus, er quandoque usque ad sanitatem et ægritudinem, et usque ad mortem: contingit

3. *Dispositions.*—The exercise of any mental faculty implies a change, a modification of that faculty whether it be organic or inorganic, and therefore also, in a more remote manner, of the mind itself. The impresssion (species) produced on the faculty by its object, and the activity of the faculty in response to the stimulation, cannot take place without altering more or less deeply, more or less permanently, the subject that receives the impression by which its own operation has been determined. A trace is left, an after-effect, which is the principle of memory and of habit. The intellect, for instance, after eliciting a cognitive act, remains the same faculty, but not in the same condition.[1]

In order to understand how an operation or successive operations can influence the exercise of a faculty, we must notice that faculties mean essentially a relation to a certain function, or rather to a certain group of functions. "Oportet quod (anima) habeat plures et diversas potentias correspondentes diversitati suarum actionum: potentia enim ad actum dicitur *correlative.*"[2]

Modern psychologists use exactly the same language. Thus Höfler, to quote only one: "Psychical dispositions are, as all forces, faculties, powers, distinguished and divided according to the real, actual psychical processes for which or to which they dispose. In this sense to every disposition corresponds an actual correlate. (Jeder Disposition kommt in diesem Sinne ein actuelles Correlat zu.)"[3]

enim aliquem ex gaudio vel tristitia, vel amore mortem incurrere. . . . Anima coniuncta corpori eius complexiones imitatur, secundum amentiam vel docilitatem et alia huiusmodi. . . . Similiter ex viribus superioribus fit redundantia in inferiores; cum ad motum voluntatis intensum sequitur passio in sensuali appetitu, et ex intensa contemplatione retrahuntur vel impediuntur vires animales a suis actibus; et e converso ex viribus inferioribus fit redundantia in superiores; ut cum ex vehementia passionum in sensuali appetitu existentium, obtenebratur ratio ut iudicet quasi simpliciter bonum id circa quod homo per passionem afficitur." *Quæst. disp. De veritate,* q. 26, art. 10. Cf. *De spirit. creat.,* art. 11.

[1] "Intellectus . . . ex hoc quod recipit species intelligibilium, habet quod possit operari cum voluerit, non autem quod semper operetur; quia et tunc est quodammodo in potentia, sed aliter quam ante intelligere, eo scilicet modo quo sciens in habitu est in potentia ad considerandum in actu." *Summa theol.,* P. I., q. 79, art. 6.

[2] *Quæst. disp. De anima,* art. 12; cf. art. 13.

[3] *Psychologie,* p. 20.

Since a faculty is a special mode of energy of the soul, it has from its very nature a certain class of objects which it can reach, to which it tends. The eye perceives colors, the ear sounds, the intellect abstract and universal essences, etc. "Potentia visiva est ordinata ad cognoscendum omnes colores. Cognoscere immaterialiter convenit intellectui ex ipsa natura potentiæ."[1] This general aptitude the faculty obtains from the very fact that it is such a faculty, acting in such a manner, through such an organ. Further than this the faculty of itself is not determined, but it has a manifold virtue, and can perform many different actions. Thus the eye can perceive all colors, the ear can distinguish many sounds. "Potentia est multiplex virtute secundum quod ad multos actus specie differentes se extendit."[2]

But the dispositions which are left in the faculty after exercise are a more special determination of it to perform one operation rather than others, to perform it more easily and rapidly. They narrow down the tendency of the faculty to a more restricted field. "Potentia est indeterminata quantum est de se, et per habitum determinatur ad hoc vel illud."[3] A disposition may be absent where the general faculty is present. A man who has never studied mathematics has no disposition to undertake the solution of mathematical problems; he does not feel inclined to do it, nor has he the aptitude to succeed even if he tried. Yet we cannot say that he has not the general faculty to do it, since he has the faculty of intelligence. If he sets to study, there is no doubt that he can acquire those dispositions to a certain extent. His intellectual faculty will receive a new tendency, a new ability. Whereas it has been hitherto engaged in other lines of study, it can now be brought to concentrate its energy on this special point. Success will vary with the individuals, and depends on many other factors, but it is certain that exercise will always modify the faculty.

When we have said that dispositions narrow down the tendency of a faculty, it must be understood of such dispositions

[1] *Quæst. disp. De veritate,* q. 20, art. 2; q. 24, art. 4, ad. 4.
[2] *Summa theol.,* Ia IIæ, q. 54, art. 1, ad 2.
[3] *Quæst. disp. De virtutibus,* art. 3.

as have already reached a certain degree of intensity. The first acts, although they produce some modification, for otherwise the acquisition of habits would be impossible, do not, at least generally, have a noticeable effect on subsequent actions of the faculty. It is by repetition that habit is acquired and strengthened, while on the contrary it is weakened by abstaining from action, or by performing contrary actions.[1] The same is true of the body; exercise of an organ makes it more powerful and skilful; idleness, on the contrary, weakens it. In a similar manner, exercise strengthens one faculty of the mind, and as the energy of the soul is limited, it also tends to diminish the power of other faculties.

A disposition therefore is selective; in proportion as it grows it tends to exclude other forms of consciousness and activity. It concentrates the soul's activity and gives it a special direction; if it is strong enough it may even endanger the natural order and harmony of the faculties, and cause abnormal states of mind. It also follows that for each action, those forms shall prevail which have been more frequently in the faculty. The same object, especially if it is complex, will be represented in the minds of several individuals by very different ideas. The statesman and the citizen, the rich and the poor, the educated and the ignorant, the man of the city and the man of the country, may all be delighted at the same stage performance, but no two individuals will view it in the same light and find exactly the same motives for being satisfied. The same edifice will not excite the same ideas in the mind of the architect, of the builder, of the carpenter, of the bricklayer, of the occupant and of the neighbor. Each one has his own point of view determined largely by the dispositions which previous actions and mental states have left in his mind.

The faculty which draws to itself the soul energy acts in a more intense manner; it needs less and less stimulation in order to act. As soon as the idea is suggested, immediately, mechanically, the faculty performs its action, without effort, and frequently without distinct consciousness of what it is doing.

[1] Cf. Aristotle, *Ethic. Nicom.*, II., 2; III., 8. St. Thomas, *Summa theol.*, Ia IIæ, q. 51, art. 2; q. 52, art. 1, 2, 3; q. 53, art. 1, 3.

It even escapes more or less perfectly the control of a higher faculty that might check its tendency. It may reach a point where the will is unable to exercise its power, where habit is too strong and cannot be resisted. Hence habit is rightly termed a second nature.[1]

All these effects had been reduced by St. Thomas to the three following: (1) Uniformity; habits strengthen the natural tendency of the faculty. (2) Perfection and ease; a man without habit would have to examine the advisability of every one of his daily actions.[2] (3) Pleasure; habits make the action easy, natural, and hence agreeable.[3]

Dispositions affect immediately the faculty; they are more than the mere faculty, and are not yet the operation; they are 'medium quoddam inter potentiam et actum.'[4] And thus by modifying the faculty, they also modify the soul.[5] A faculty may be nearer and nearer to its operation; it may be 'proxima'

[1] Cf. Aristotle, *Rhetor.*, I., 11, esp. 1370a, 7. St. Thomas, *Quæst. disp. De veritate,* q. 20, art. 2; *De virtutibus in communi,* q. 1, art. 1.

[2] Cf. James, *Principles of Psychology,* p. 122. "There is no more miserable human being than one in whom nothing is habitual but indecision, and for whom the lighting of every cigar, the drinking of every cup, the time of rising and going to bed every day, and the beginning of every bit of work, are subjects of express volitional deliberation. Full half the time of such a man goes to the deciding, or regretting, of matters which ought to be so ingrained in him as practically not to exist for his consciousness at all."

[3] "Habitibus virtutum ad tria indigemus. Primo ut sit uniformitas in sua operatione; ea enim quæ ex sola operatione dependent facile immutantur, nisi secundum aliquam inclinationem habitualem fuerint stabilita. Secundo ut operatio perfecta in promptu habeatur; nisi enim potentia rationalis per habitum aliquo modo inclinetur ad unum, oportebit semper cum necesse fuerit operari, præcedere inquisitionem de operatione; sicut patet de eo qui vult considerare, nondum habens scientiæ habitum, et qui vult secundum virtutem agere, habitu virtutis carens, unde Philosophus dicit (in V. Ethic., c. III.) quod repentina sunt ab habitu. Tertio ut delectabiliter perfecta operatio compleatur; quod quidem fit per habitum, qui cum sit per modum cuiusdam naturæ, operationem sibi propriam quasi naturalem reddit, et per consequens delectabilem." *Quæst. disp. De virtutibus in communi,* q. 1, art. 1. Cf. *De veritate,* q. 20, art. 2; *Summa theol.,* Ia IIæ, q. 49, art. 4; q. 78, art. 2.

[4] *Summa theol.,* P. I., q. 87, art. 2; Ia IIæ, q. 50, art. 4, ad 2, etc.

"Maxime habitus inveniuntur in anima, in quantum anima non determinatur ad unam operationem, sed se habet ad multas. . . . Et quia anima est principium operationum per suas potentias, ideo secundum hoc habitus sunt in anima secundum suas potentias." *Summa theol.,* Ia IIæ, q. 50, art. 2.

or 'remota,' with all the intermediary degrees between those two extremes. Dispositions incline it more and more to act, and give an always increasing facility in proportion as they are themselves more intense.

The same faculty can be the subject of several dispositions, because it can be the principle of several different operations.[1] But it must be remarked that dispositions, like the faculties themselves, are not independent of, but subordinate to one another, 'Quanto aliqua potentia est altior, tanto ad plura se extendit, unde habet communiorem rationem obiecti.'[2] This explains how dispositions can combine and influence one another. Strength of will, self-restraint, for instance, may modify many operations of the other faculties, because the will is supreme in the mental world; it has a more or less absolute power over all the other faculties.[3]

We have compared the faculties to rivers or streams conveying in several directions, through several channels, the water of one and the same source. Each river in turn may subdivide, and distribute the water which it carries into several smaller rivulets. It is clear that if some change be produced in the water at the source itself, the water, in whatever direction it flows, will undergo the same change. And if the change be produced in one of the higher channels, one of those nearer to the source, the influence will be greater than if it were produced in one of the last and smallest brooks. In the same manner, if the highest faculties of man be modified, the modification extends farther than if it affected the lowest faculties. If one sense-organ be diseased, the others may still continue to exercise their functions as well and as regularly as before. But if the brain be diseased, it is likely that its condition will affect in a varying degree the organs of sense. For, according to the scholastics, the brain, and not the heart, as in Aristotle,[4] is the

[1] Cf. *Summa theol.*, Ia IIæ, q. 54, art. 1, ad 1 et ad 2.

[2] *Quæst. disp. De anima*, art. 13, ad 4.

[3] *Summa theol.*, Ia IIæ, q. 17.

[4] Cf. *De part. anim.*, II., 10, 656a, 27 ff. *De iuvent. et senect.*, III., 469a, 10. *De animal. gener.*, l. II., cc. 6, 8, etc. Cf. Bonitz, *Index Aristotelicus*, s. v. καρδία, 365b, 34.

central organ, the central sense, the seat of imagination and of memory.[1] This is even the reason given to explain why the brain of man is larger, in proportion to his body, than the brain of other animals. The intellectual faculties cannot be exercised without these sensitive faculties which have their seat in the brain.[2]

The brain is 'the common root' of the external senses. From it the other organs derive their sensory power, and to it as to their common center they transmit their various impressions.[3]

The *sensus communis,* imagination, memory, instinct, 'have their organs in the brain.'[4] A more precise localization is mentioned by Albertus Magnus as commonly received by the Peripateticians.[5] The *sensus communis* has its seat in the anterior part of the brain 'where the sensory nerves of the five external senses meet as in their common center.' This part of the brain is 'moist and full of marrow'; it can therefore receive impressions easily. To preserve the images, a harder substance is required; the seat of the imagination is behind that of the *sensus communis;* this part, being cooler and harder, is better adapted to the retention of the 'sensible forms.' The organ of the *aestimativa* is in the first part of the middle ventricle of the brain, which 'is warmed by the movement of the spirits.' Memory is localized in the posterior part of the brain, 'a dry place on account of the motor nerves which start

[1] Cf. *Summa theol.,* P. I., q. 78, art. 4; *Quæst. disp. De veritate,* q. 18, art. 8, ad 5.

[2] "Necessarium fuit quod homo inter omnia animalia respectu sui corporis haberet maximum cerebrum, ut liberius perficerentur operationes interiorum virium sensitivarum quæ sunt necessariæ ad intellectus operationem." *Summa theol.,* P. I., q. 91, art. 3, ad 1.

[3] "A corde derivatur virtus sensitiva ad cerebrum, et exinde procedit ad organa trium sensuum, visus, auditus et odoratus." "Vis sentiendi diffunditur in organa quinque sensuum externorum ab aliqua una radice communi a qua procedit vis sentiendi in omnia organa, ad quam etiam terminantur omnes immutationes singulorum organorum." *Comment. de sensu et sens,* lect. 5; et in libro III. de anima, lect. 3. Cf. *Summa theol.,* P. I., quæst. 78, art. 4, ad 1.

[4] *Quæst. disp. De verit.,* q. 18, art. 8.

[5] A similar localization is taught by the author of the *Opusculum De potentiis animæ* (c. IV.). This work is attributed to St. Thomas, but its genuineness is not certain.

from there'; the sign of this localization is that 'in all animals injury to this part destroys or impairs the memory.' Finally the organ of the phantasy is in the middle of the middle ventricle, between the organ of memory and that of imagination. The reason is that 'injury to this part of the brain always prevents the animal from coördinating its actions (non habetur ab aliquo animali ordinatum regimen vitæ) . . . and eventually drives the animal to madness.'[1]

This localization and the anatomical and physiological considerations which accompany it would doubtless have little value in presence of modern investigations. But the principle of a localization of functions is recognized, and some reasons why it must be admitted are indicated.

From the general idea of faculties, we undersand how that which affects and modifies the higher can also affect and modify the lower. But it is important to notice that the reciprocal is true, and that our comparison with a river, good though it was as far as it went, was imperfect and incomplete. There are mutual relations of dependence among the faculties. Even the inferior contribute to the operations of the superior. The brain, *e. g.,* as we see in the text quoted above from St. Thomas, is not only the 'common root from which all sense energy proceeds,' but also 'to which all impressions of the various sense organs are transmitted.' We have also seen that the highest faculties in man, the intellectual, depend on the senses as on a *conditio sine qua non.* Although they are exercised without organs, nevertheless, if the organs be diseased, intellectual operations cannot be normally performed.[2] The soul is both the principle and the term of all its faculties, either in itself or as animating the organism. They neither act of themselves, nor for themselves, nor, so to speak, in their own name; but they act by the energy of the soul, for the soul, and in the soul's name. Their operations are the operations of the soul, or at least of the '*organum animatum*'; whatever affects them affects

[1] Albertus Magnus, *De anima,* L. II., tract. IV., cap. VII.

[2] "Videmus enim quod impedito actu virtutis imaginativæ per læsionem organi ut in phreneticis, et similiter impedito actu memorativæ virtutis, ut in lethargicis, impeditur homo ab intelligendo." *Summa theol.,* P. I., q. 84, art. 7.

also the soul; and even nothing can affect the soul except in and through its faculties and their operations.

4. *Conclusion.*—The scholastic view of the soul seems to fulfill the requisites of the theory of psychical dispositions. It does not make dispositions themselves directly and immediately known to us, but it makes their existence possible.[1]

We have a subject permanent and identical which is modified in its various faculties by the dispositions which it receives; a subject whose operations can be facilitated; which can really own its past, retain it, and recognize the similarity between the present and the past conscious experience. Thus is shown the relation between memory and habit, which was insisted upon by Malebranche, and is to-day emphasized so strongly by Ribot and Richet. The modification which any faculty receives from its operation is a lasting effect. In the cognitive faculties, the 'species' remains 'ut habitus, ut dispositio,' as St. Thomas frequently repeats; it produces 'habitual' science which can be made 'actual'; it is 'medium inter potentiam et actum.' The same is applied to habit; it is also the result of previous operation, and is also something 'inter potentiam puram et operationem.'

Finally the theory, while it explains the possibility of purely psychical dispositions,—since the soul does not communicate to the body its whole being, and does not share with it all its operations—does not, however, neglect physical, organic dispositions. The body concurs even in the highest functions of the mind; it also preserves dispositions, which are not only material, but necessarily psychophysical, since the whole body, down to its smallest fibers, is permeated by the soul and derives from it all its activity.

Thus all faculties, dispositions and habits, the organic and

[1] "In quantum habitus deficit ab actu perfecto, deficit ab hoc ut non sit per seipsum cognoscibilis; sed necesse est quod per actum suum cognoscatur; sive dum aliquis percipit se habere habitum per hoc quod percipit se producere actum proprium illius habitus; sive dum aliquis inquirit naturam et rationem habitus ex consideratione actus. Et prima quidem cognitio habitus fit per ipsam præsentiam habitus, quia ex hoc ipso quod est præsens, actum causat in quo statim percipitur. Secunda autem cognitio fit per studiosam inquisitionem." *Summa theol.*, P. I., q. 87, art. 2. Cf. *Quæst. disp. De veritate,* q. 10, art. 9.

the mental series, body and soul, are combined in one harmonious unity by which their influence on each other is made possible. The Aristotelian and scholastic theory takes a middle course between two extremes: Cartesian dualism and interaction, and Spinozistic monism. It admits a duality of constituent principles, but the substantial unity of man. There is a 'double aspect' of one substance, a 'two-sided cause'; body and mind proceed 'as undivided twins'; and this is accounted for by the intimate union of body and soul.

As far as the theory of psychical dispositions is concerned, the system seems to give a more satisfactory answer than any other. If the mind is but a series of states, if there is no permanent subject, we cannot understand how a disposition can be preserved permanently; just as we cannot understand how a cerebral disposition could reside in brain processes, if there was no brain substance. The psychologist who refuses to go beyond the disposition is in danger of offering a mere word instead of a real explanation.

Moreover the scholastic theory, with its distinction of faculties, makes us understand better the rôle of dispositions in mental life. If we exercise an organ of the body more than another, it will acquire a greater development, a greater strength, a greater aptitude to be exercised again with less difficulty and fatigue. The faculty of the soul is a power to act. That power can be modified, increased by the dispositions or permanent after-effects which exercise leaves in the faculty.

We have insisted on the scholastic view, more perhaps than was necessary for our purpose. But there was a special reason to do so; scholastic philosophy is very little known, frequently misunderstood and misrepresented, charged with absurdities which do not belong to it. What is the value of the system in itself? Has it a sufficient basis in experience? Can it face successfully the data of science and be adapted to the conclusions of modern psychology? We do not know. But the question may be worth examining; and we believe that it is hardly fair for the historian of philosophy to keep silent on the whole medieval period; and for the psychologist or the philos-

opher, to dismiss *a priori* all the theories of scholasticism on the explicitly or implicitly avowed plea that we must do away with all that is scholastic. One thing seems sure, that with regard to the general theory of psychical dispositions, the scholastics have a merit which perhaps not all modern psychologists can claim: that of logical consistency.

Conclusion.

If we now cast a general glance over the whole field of our investigation, the results can be briefly summarized in the following manner.

The theory of psychical dispositions is not new. The old psychology also admitted it; it was proposed in other terms, under other names, but notwithstanding differences in the details, it was essentially the same as the modern theory, and it was devised in order to explain the same facts.

Psychical dispositions seem to be necessary in order to interpret the data of empirical psychology; they are, therefore, in that respect, a legitimate postulate. However important for our mental life bodily dispositions may be, however well ascertained be the fact of nervous habituation, this nevertheless is inadequate to sufficiently account for all the facts of our mental life. Something more is required in the mind itself.

No system, it is true, can give us a direct knowledge of the existence or of the nature of psychical dispositions, since they are essentially outside of consciousness. They are postulates transcending experience, and the only knowledge that we can have of them, is acquired by reasoning from their effects, in order to reach, so far as it is possible, the cause that produces them.

But if one may and must admit psychical dispositions, it is not logical to do so in a system where the mind is supposed to consist merely of a series of conscious states, whatever be the particular mode according to which that series is explained.

The scholastic system, on the contrary, with its concept of a substantial soul endowed with various faculties, may and does consistently postulate psychical dispositions.

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